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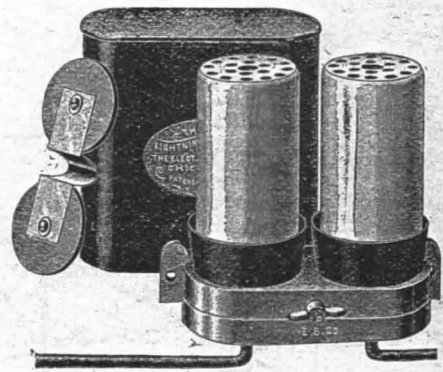


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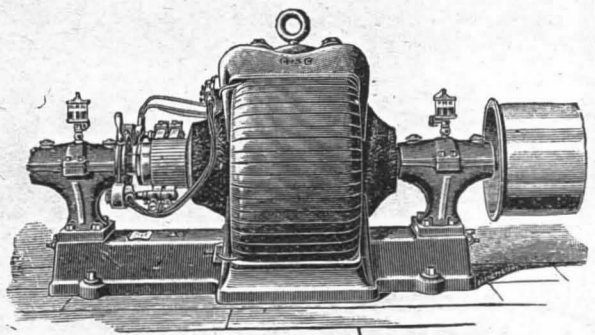
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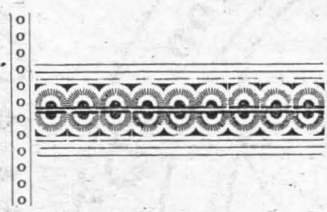


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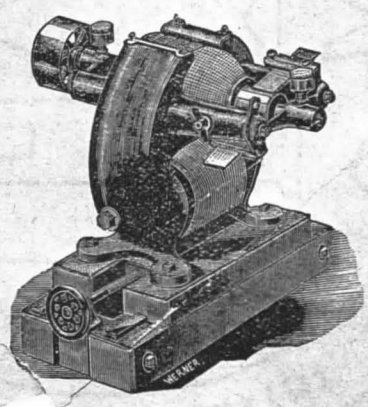
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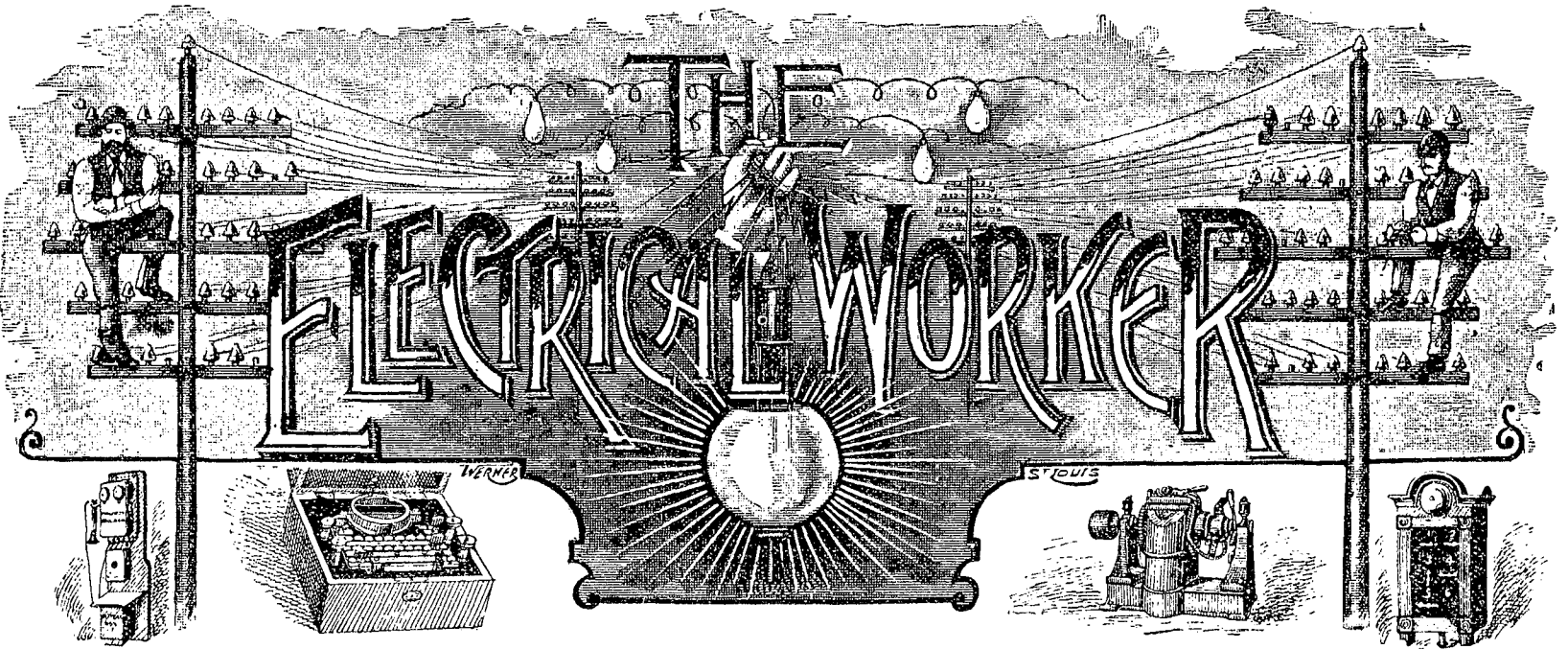
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Steam Engine Efficiency—Its Possibilities and Limitations.

By WM. H. BRYAN, Member Engineers' Club of St. Louis.

(Read Oct. 19, 1892.)

Among the steam using public there is not a little uncertainty as to just what is meant by steam engine efficiency. And many engineers, who, in the multiplicity of their duties in other directions, have found little or no time for research in this field, are frequently mystified. We are told, for instance, that the exhaust should always be condensed; that engines using steam expansively are better than engines with throttling governors; that double compound engines are better than single cylinder; that triple compound engines are still better; and that if we desire to reach the highest efficiency, we must use the quadruple compound engine.

These statements come from the highest authorities, who point to many instances of success; and yet we need not go far to find cases where results quite the contrary have been found—where the addition of a condenser has resulted in an increase in the coal bill; the cut-off engine has proved more wasteful than the throttling engine; the single cylinder than any form of multiple-cylinder. So signal have been the failures in some cases, that the business man, judging efficiency solely from the standpoint of dollars and cents, has felt called upon to denounce the whole idea of higher economy as laid down by the authorities, and all the improved appliances thereto. And thus another failure is recorded, and the theoretical is again claimed to be at variance with the practical.

I have had occasion before this to discuss the relations between theory and practice (see *Age of Steel* of June 25, 1892, and shall not now take them up. Suffice it to say, that when such discrepancies appear we have either made a wrong application of a true theory, or, we have selected a theory which in no way fits the case in hand.

I bring to you this evening no startling or newly developed theories, no unexpected or disappointing results from practice. I can not even claim the merit of originality or novelty for what I have to say, for the facts are all of record, and were laid down by master minds, whose invaluable researches have made our present knowledge possible. I shall feel amply rewarded if I succeed in calling serious



HENRY MILLER, Grand President.

Mr. Henry Miller was born on January 5th, 1858, in Gilebsy County, near Friderichsburg, Tex., and was raised on a ranch until nearly 14 years of age.

His first introduction into electrical work was in the employ of the United States Government, building a telegraph line from San Antonio, Tex., to Fort Clark and intermediate points, connecting all the military posts along the Rio Grande.

After leaving the Government employ in 1875 he went to work for the Western Union under different foremen and superintendents. His first responsible position was taking charge, as repairer, on

the Morgan road from Algieres, La., to Morgan City. He afterwards had charge of a division on the Sante Fe; was assistant superintendent for the Erie Telephone Company in the southwest district, remaining with them six years. Desiring to make a change, he left their employ in 1885.

After being employed by different electric light companies he landed in St. Louis in June, 1886, and was employed by the Municipal Electric Light and Power Company until May, 1890. Since then he has been in almost every city in the country organizing the Brotherhood.

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attention to a few principles underlying the success of the commercial steam engine, pointing out its strong features and its drawbacks, even though I may not indicate clearly the proper path to follow in any given case.

It is necessary to consider the steam engine in two aspects—the ideal and the real. The former is the perfect engine, the thermo-dynamic engine, the engine of the philosophers of the Carnot cycle. It does not exist, never has existed and never will exist. It has no standing in the world of practical mechanics, but it has, nevertheless, a place of great importance in the world of the student. It is this engine which tells us what is before us, and which sets a limit to our ambitions—a limit which we shall never reach, and which is still far beyond us, but which warrants our most earnest efforts in drawing nearer to it.

The conception of the ideal or perfect engine is simple. Steam considered as perfect gas expands as many times as we choose, in a single perfect cylinder, the walls of which neither absorb nor give out heat. We measure its losses by the difference between the temperatures T_1 T_2 , between which it works, and its efficiency by $\frac{T_1 - T_2}{T_1}$ measured in

each case from the absolute zero, 461 degrees below the zero of Fahrenheit. An efficiency of unity is therefore attainable only by discharging the exhaust at the absolute zero of temperature—a condition now manifestly impossible, and likely always to remain so.

We see, then, that the perfect steam engine itself is of low efficiency, due to the comparatively narrow limits of temperature within which we must work. It is possible, however, to clearly determine the efficiency of a perfect heat engine working between the limits of temperature now common in practice. Cotterill, in his admirable work on "The Steam Engine Considered as a Heat Engine," states them as follows:

TYPE OF ENGINE.	Superior Limit.		Inferior Limit.		lbs. Steam Per H. Hour.	Efficiency.
	Pressure Abs.	Temps F.	Pressure Abs.	Temps F.		
Non-Condensing.....	250	401	14.7	212	11.4	.219
	150	363	"	"	18.8	.183
	120	341	"	"	15.8	.161
	80	312	"	"	19.9	.130
	55	287	"	"	26.0	.100
Condensing.....	120	341	0	100	7.5	.299
	95	324	"	"	8.1	.285
	60	293	"	"	9.0	.256
	30	250	"	"	11.2	.211
	20	288	"	"	12.8	.186

From which it appears that the perfect engine, with condenser, running with 105 pounds gauge pressure, requires $7\frac{1}{2}$ pounds of steam per horse-power per hour; and that, even then, its efficiency is less than 30 per cent. In other words, if it were possible to transform all the heat units in the steam into useful work, but $2\frac{1}{4}$ pounds of steam per horse power per hour would be required.

It is evident, therefore, from a consideration of the theory of the steam engine, that there are drawbacks inherent in this form of motor, which set a definite limit to its economy. This has led to a wide investigation in other fields for a more efficient motor—not without some promise of success—but the many advantages and conveniences of the steam engine will, in all probability, keep it with us for many years.

Let us now take up the actual commercial steam engine of today.

It has many frailties. It lacks as much of attaining the efficiency of the perfect engine as the latter does of fully utilizing the heat units which, if the expression may be allowed, pass through its fingers. The apparently simple requirements of the perfect engine are impossible of attainment. Steam is not a perfect gas when saturated—and only approximately so when superheated. The number of expansions possible in practice is limited. High initial temperatures and pressures mean increase in

first cost, and cost of maintenance, greater liability to accident, and greater losses through leakage. The limit in the other direction is even more rigidly fixed. A condenser temperature of 100 degrees F. is even lower than can ordinarily be obtained. It is true that Du Tremblay lowered the final temperature to 60 degrees by the addition of an ether engine, working between the temperature of exhaust steam and that of the condensation of ether, by which means he secured an efficiency of 35 per cent for the perfect engine. This plan, however, has not come into general use, and probably never will, on account of the practical difficulties connected with the use of ether.

Furthermore, a large number of expansions in a single cylinder means a very large vessel, very rigid and heavy construction, and serious losses due to internal condensation—the comparatively cold walls of the cylinder robbing the entering steam of a large number of its heat units, and giving them back near the end of the stroke, too late for transformation into useful work, and where they are swept out by the exhaust.

These difficulties have led to the development of the multiple-cylinder engine, in which the steam is worked successively through a number of cylinders in series. This has resulted in a better distribution of the strains, and, as Prof. Thurston has recently pointed out so clearly, confines the losses to those of a single cylinder working between comparatively narrow limits of temperature. The heat units restored in the latter part of the stroke, instead of being swept away unused, are available for efficient service in the next succeeding cylinder.

Practical difficulties are soon encountered here, however. Multiple-cylinders mean greatly increased first cost for the same capacity, greater complication of parts, and as a result more liability to derangement, besides requiring a higher and better paid class of skilled labor in their operation. In addition, there is an increased cost for space and for foundations.

The real steam engine—whether simple or multiple-cylinder—is subject to still further losses. Piston speeds are confined within narrow limits; clearance spaces may be reduced, but can not be wholly done away with; valve gears are slow in acting and imperfect; valves themselves, as well as pistons, leak; and more or less heat is lost through conduction and radiation.

And, in practice, the losses do not stop here. No engine, however well constructed and designed, ever has perfect care. Leaks occur and grow. Adjustments become less and less accurate. Steam is frequently wet. Steam passages are uncovered, and sometimes they are badly cramped. Worst of all, the work is frequently far different from that for which the engine was designed. An underload is even more fatal to good economy than an overload, but it is frequently unavoidable, as power must be provided for prospective as well as present requirements. Furthermore, it is frequently necessary that an engine be sufficiently large to handle sudden and severe overloads, as in rolling mill and electric railway service. Here the maximum is sometimes many times the average load, so that conditions favorable to high steam efficiency are impossible of attainment.

There is one other loss which can not be wholly overlooked in this discussion—that of friction of the engine itself—which reduces the indicated horse-power to that known as "net effective," capable of delivery to the work in hand. This is a question wholly of design, construction and care in operating, and is largely increased by the complication of parts necessary in multiple-cylinder, or other types of high efficiency engines.

I believe I need say no more to convince you that the conscientious engineer who would select the best engine for any given work, has a problem of no mean proportions on his hands. It is half the battle to be able to definitely and clearly state the conditions, but this is often difficult and sometimes impossible. The question comes to us in a wide variety of forms. We can not always determine in advance what our load may be; and if we could, it is more difficult in many lines of work to determine the maximum and minimum requirements, and to give them their proper relative value as compared with the average load.

Let us assume, however, that we are able to simplify the problem to that of selecting or designing the type of engine best adapted for a given, constant load of specified duration. This leaves us free to select the initial and terminal pressures and temperatures; the general type of engine, whether single or multiple-cylinder, condensing or non-condensing; piston and rotative speed; and whether we shall jacket the cylinders and use saturated or superheated steam.

First, it will be interesting to make some comparisons of existing engines of well-known types, to determine what efficiency is already attainable in practice, under the most favorable conditions.

EFFICIENCY OF ACTUAL ENGINES.										
No.	TYPE OF ENGINE.	SUPERIOR LIMIT.		INFERIOR LIMIT.		Steam lbs. per I. H. P.		A.	B.	EFFICIENCIES.
		Pressure Absolute.	Temperature F.	Pressure Absolute.	Temperature F.	Ideal.	Actual.			
1	{ Tr. Comp. Condensing. Cr. Comp. Con. Tan. Comp. Con. Ver. Comp. Con. Corliss S. C. Corliss N. C. Locomotive. Loco've Comp. Slide Valve.	140.	353.	1.5	115.	7,925	12.67	183	292	625
2		140.	353.	1.8	109.	7,615	12.94	176	300	588
3		118.	337.	1.7	115.	8,364	13.26	176	278	632
4		111.	335.	1.7	115.	8,437	14.50	174	276	577
5		177.	339.	2.	120.	8,933	14.07	174	274	577
6		72.	305.	4.6	112.	9,283	18.59	126	253	500
7		89.	319.	15.9	216.	19,222	25.39	102	182	769
8		180.	347.	20.2	228.	17,574	26.86	96	174	654
9		151.	332.	19.4	226.	15,831	20.86	125	169	739
10		98.	323.	17.2	220.	19,549	52.34	0.63	103	614

While this data is not as complete as I would like to have it, it is nevertheless worthy of study. The results given under the head of Efficiencies are particularly interesting. Column A indicates the efficiency of the engine as regards the total heat units in the steam. Column B indicates the efficiency of a perfect heat engine working between the given limits of temperature. Column C represents the relative efficiency; that is to say, the ratio of the heat units utilized to those available within the limits of temperature between which the engine is working.

The efficiencies shown in column C are of special interest, as they indicate the extent to which each type of engine utilizes its opportunities as a heat engine. The steam consumption of the ideal engine, as shown in column 7, is the limit toward which we should continually draw near. The efficiencies in column C show how much our present engines lack of reaching perfection. It is not too much to expect that these efficiencies may be continually improved in time by improving types of engine, as the losses may all be termed preventable, at least in very large part.

Considered wholly as heat engines, the complicated "High Efficiency" machines are less efficient than engines of similar construction. This is as might be expected, on account of the fewer opportunities for leakages and other losses.

A curious fact is shown by test number 7. The ordinary single cylinder, non-condensing engine, which has a theoretical efficiency of less than half that of the triple expansion engine, appears in the present instance to have a relative efficiency very much greater.

No. 1 is the triple compound vertical condensing pumping engine of 15,000,000 gallons capacity daily, at the Harrison Street pumping station, Chicago. The test was made by D. H. Fiend, Assistant City Engineer.

No. 2 is a horizontal triple compound condensing engine in the plant of the Narragansett Electric Lighting Company, Providence, R. I. This test was made by E. D. Leavitt.

No. 3 is a cross-compound engine in the mills of the Richmond Manufacturing Company, Bristol, R. I. The test was made by Remington and Henthorn, engineers, Providence, R. I.

No. 4 is a tandem compound condensing engine in the works of the Plymouth Cordage Company, Plymouth, Mass. This test also was made by Mr. Leavitt.

No. 5 is a vertical compound condensing engine. All the above engines were built by the Edward P. Allies Company, Milwaukee.

Nos. 6 and 7 are from tests made in 1877 by John W. Hill, on an 18x42 Harris Corliss, speeded 75; located in the flour mill of Gibson & Co., Indianapolis, Ind.

Nos. 8 and 9 are Baldwin locomotives on the Baltimore & Ohio Railroad, the test being made by George H. Barrus in 1890. No. 9 is the only authentic record I could find of a non-condensing compound engine, but I think the results fairly represent what may be secured from similar stationary engines.

No. 10 is from a well-designed slide-valve engine, 40-horsepower, 9x15.6, speed 195, tested at the Sixth Cincinnati Industrial Exposition in 1875

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by John W. Hill, Isaac V. Holmes and J. F. Flagg. The results are undoubtedly much better than can be secured from the ordinary slide-valve engine, which rarely falls below forty pounds steam per I. H. P. hour. In fact, the results given may be taken as fairly representative of the best high-speed automatic cut-off engine practice of the present day.

High efficiency is evidently a question of cost, both in plant and skilled attendance. High-duty engines, with the necessary high-pressure boilers and pipe work, are expensive at first and difficult to maintain. The problem, then, appears to be not what is the highest efficiency possible, but how high an efficiency can we afford.

I shall not attempt to answer this question in detail. It is a complicated one, and can only be definitely settled by a special consideration of the peculiar features surrounding each case.

The important advantages to be gained by the use of high efficiency engines are:

1st. Reduced fuel bills; and 2d—Reduced first cost of boilers, with their settings, and the space they occupy, there being fewer of them required.

As the second consideration is usually much more than off-set by the increased cost and space occupied by the engines, we may reduce the problem to that of the net saving in fuel, and its value in dollars and cents. By the latter standard must all such problems be judged. The most ordinary slide-valve engine is amply efficient at the mouth of a coal pit, while in distant mountain regions, where fuel is very costly, the highest grade of multiple-cylinder condensing engines are usually justified. This conclusion, however, must be modified in any particular case by the surroundings. Is water available at reasonable cost, for condensing? Can skilled attendance be had? Is the engine of a complicated nature, liable to accident, and difficult and expensive to repair? Is the load sufficiently large and constant to insure the results anticipated?

For variable loads the engine can not reach as high an efficiency as with a constant load; and economy must frequently be made secondary to securing enough capacity for sudden and momentary overloads.

Prof. Thurston gives the following table as representing the best practice, as applied to the total number of expansions desirable, and best number for each cylinder:

	TOTAL.	SINGLE.	LIMIT OF PRESSURE.
Single cylinder...	5	5	50
Single cylinder...	6	6	60
Compound.....	9	3	90
Triple.....	27	3	270
Quadruple.....	81	3	810
Quintuple.....	243	3	2430

This does not accord entirely with western practice, where 80 lbs. for single, 100 to 120 for compound, and 150 to 200 for triple expansion, are thought to be about correct. I have not, however, been able to find any data warranting these figures.

In fact the superior actual efficiency of the engine No. 7 over No. 1 in our table, may possibly be explained by the fact that the superior temperatures and pressures were entirely too low in the latter case.

The efficiency of pumping engines is measured in foot-pounds of work done by 100 pounds of coal burned. And in order to eliminate the question of the quality of the fuel and the efficiency of the boiler, an evaporation of ten to one is often assumed, so that the duty then becomes the number of foot-pounds of work done by the engine with 1,000 pounds of dry steam. In order to compare the efficiency of pumping engines with that of ordinary engines, I have deducted the following formula:

$$D = \frac{1980}{S} \text{ or, } S = \frac{1980}{D}$$

In which D is the duty as last defined above, and S the lbs. water evaporated per horse power per hour. It is sufficiently accurate for ordinary purposes to call the figures 2,000, which greatly facilitates carrying the formula in one's mind.

The formula as given is not strictly accurate, as the duty is always net useful work, while steam efficiency is usually measured per indicated horse power. The former, in case of engine No. 1, in our table, was exactly ten per cent less than the latter. This loss is slightly greater than usual, however, on account of the necessarily complicated construction of the engine. It frequently falls to five per cent with ordinary engines of good construction.

When you visit Chicago do not forget to call on the old-time friend of electrical workers, John E. Fitzpatrick, 204 Washington street, Chicago.

Some Telephone Troubles.

(Law System.)

There is no reason why an electrical worker should not have a thorough understanding of at least the fundamental laws of electricity. Everyday incidents occur which illustrate these laws and impress them on his mind far more forcibly than any schoolroom experiment could.

To derive benefit from these incidental experiments it is necessary to know a few facts about electricity and magnetism. That to cause a flow of current there must be a difference of potential; that a conductor offers resistance to this flow; that flow of current, or currents is equal to the difference of potential, E , divided by the resistance, R .

In magnetism: That a current flowing around a piece of iron magnetizes the iron, and that the magnetic strength to which the iron is raised depends upon the strength of current flowing around it, and the number of times the current flows around.

With these facts as a start we will review some of the troubles arising in the telephone (Law System), and see what light this knowledge of pressure, resistance and current can shed on these troubles and how these troubles may serve as an experimental illustration of fundamental laws.

In the Law System a common iron-frame vibrating bell of 30 ohms resistance is used. The inspector has been given the bell out of order. He finds the shunt, which should be closed when the telephone is on hook, open. Thus the handphone and transmitter are left in circuit with the bell. He makes the hook shunt the handphone and transmitter and the bell rings all right.

Why should the handphone and transmitter, being in circuit, cause the subscriber to report his bell out of order? Its direct effect was to increase the resistance of the circuit, its consequential effects were, by so doing, to decrease the current, and thereby the number of ampere turns or magnetizing force. The result was the bell rang weak.

Put in figures: Seventy-five cells gravity are used to ring; the pressure is 75 volts; the internal resistance of battery is, say 150 ohms; the resistance of the line we will put at 45 ohms and the bell 30 ohms; the total resistance is $150+45+30=225$ ohms. The pressure (E) 75, divided by resistance (R), $225=\text{current } (C)$, $\frac{1}{3}$ or $\frac{1}{3}$ ampere. There are 1200 turns of wire in each coil, 2400 in the two. One-third of an ampere flowing around the cores 2400 times is equal to 800 ampere turns, or one ampere flowing 800 times— $2400 \times \frac{1}{3}=800$.

These 800 ampere turns magnetize the cores sufficiently to ring the bell with vigor. Calculated with the shunt open we get the following results: Battery resistance..... 150 ohms. Line resistance..... 45 " Bell resistance..... 30 " Handphone resistance..... 150 " Transmitter resistance..... 250 "

Total resistance in circuit..... 625 ohms.

E. M. F. 75 volts—by resistance 625 ohms— $\frac{3}{25}$ of an ampere, $2400 \times \frac{3}{25}=240$ ampere turns, which do not ring the bell sufficiently loud.

Suppose the inspector had found the shunt all right, the armature adjusted to the proper distance, the line clear, but still the bell ringing weak.

Before stating the trouble he is likely to find we will see how the coils are connected.

In the first place the coils, or rather the coil cores, together with the frame, form a horseshoe magnet. One core end is a positive (north) pole, the other end is a negative (south) pole, and the frame or raised part of it is the yoke.

The outside end of the first coil is connected to the line, the inside ends are connected together, and the outside end of the second coil to frame of bell, and thence through the armature to the ground.

If the inside end of either coil crosses with its core, the cores being screwed to the frame, the second coil is thereby cut out.

We have then only 1200 times $\frac{1}{3}$ ampere=400 ampere turns, which is not enough.

The shunting of the second coil, it is true, reduces the resistance of the circuit, but the reduction is so small as to leave the current strength practically the same as these figures show.

Two hundred and twenty-five total resistance, with two coils in circuit, minus fifteen ohms resistance of one coil, leaves 210 ohms $75 \div 210 = \frac{15}{42}$. $\frac{1}{3} = \frac{14}{42}$, $\frac{15}{42} - \frac{14}{42} = \frac{1}{42}$, or the current has only been increased $\frac{1}{42}$ of an ampere by the accidental short circuiting of one coil, while the number of wire turns has been reduced $\frac{1}{2}$.

Sometimes, especially after lightning, the outside layer of the first coil crosses with frame and both coils are short circuited. Then the bell does not ring at all, because there are no ampere turns, or in figures it is $0 \times \frac{1}{3} = 0$.

There is another law of magnetism that the weak ringing of a bell may impress upon an inspector; if we look at the end of magnet (electro) around which a current is flowing in a direction opposite to that in which the hands of a watch move, the end we are looking at is the north pole. If the current flows in the same direction as the hands of a watch the end is the south pole.

Therefore, the coils being screwed to the frame so as to form a horseshoe magnet, it is necessary to have the current flow round each leg in a different direction.

If both coils are wound in the same way, both right-handed or both left-handed, the current can be made to flow in a different direction round each leg of the magnet by connecting two inside ends together.

If they are not wound the same way, an inside end must be connected to an outside end to cause the current to flow in a different direction around each leg.

It may happen and does happen that an inspector puts in a coil wound right-handed, while the coil already in is wound left-handed, the covers on the coils concealing the fact. He connects them in the usual way, two inside ends together, and finds that the bell rings weak. He remedies it by connecting an inside and outside end.

In this case the ends (free and working ends) of both coils were like poles. The yoke was a consequential pole, and the magnet thus formed, compared with a horseshoe magnet, was one of very high resistance.

A grounded line affects the bell in the same way as do these troubles in the instrument. It also interferes with talking, whereas the troubles already mentioned do not. It can teach us something about current distribution. It can also and should impress upon us the necessity of cleaning well the ends of wires to be connected.

All telephone repairers have been to 'phones where they talked to the office, heard and were heard all right; found the bell ringing satisfactorily, but being told by the office that the line was grounded, have traced it and found it wrapped round and round the common return for a full span. The dirt and rust had all but insulated them. This has been found where the wires were not up over two months.

(Common return in St. Louis is grounded at central office.)

There is much to be learned from working at a telephone. Many advanced laws can be interpreted. Even the bell can teach us much. But as this paper was intended more to start the discussion of practical electricity by members, we will not go farther at present.

Yours fraternally,

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A New Head-Light Engine.

The production of an economical head-light engine has been a question of the greatest importance to electricians and mechanics since the first introduction of electricity for illuminating railway tracks.

Many important points had to be taken into consideration; the injury to the engine attendant upon the rocking and jarring of the locomotive in motion; an engine capable of perfect and efficient service without any attention for indefinite periods of time; and other questions equally as hard to solve in order that the result would be as nearly perfect as possible.

Belt transmission being out of the question, it was necessary to produce an engine directly connected to the dynamo; it must also be self-contained to enable its securance to the locomotive; its speed should exceed a thousand revolutions under a high pressure of steam.

The majority of engines constructed embody so many wearing parts that their operation and life is uncertain; their work inefficient and the cost of maintenance so expensive as to preclude the general adoption of electric locomotive head lights.

It is therefore with pleasure that we are enabled to present to our readers some facts about a recently constructed engine, the invention of Donald H. Farquhar, of St. Louis.

The aim of the inventor has been to overcome all the objections to present styles of engines by greatly reducing the number of wearing parts, at the same time producing one that embodies all the necessary requirements, and it is believed that the brief description and illustrations will carry out his claims for improvement.

The engine consists of two rotary pistons mounted upon their respective shafts, one cylinder body and

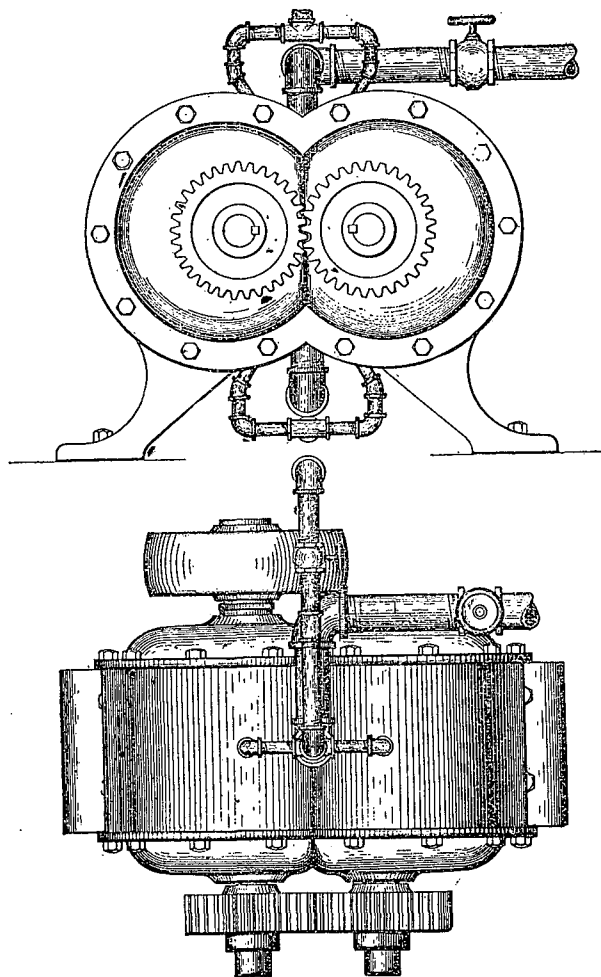


FIG. 1. (Patent Applied for.)

two covers, making in all a total of five parts in addition to the steam connections and gearing.

It will be seen that the two pistons are each provided with three heads, the heads on one adapted to pass through those on the other piston during the revolutions of the shafts.

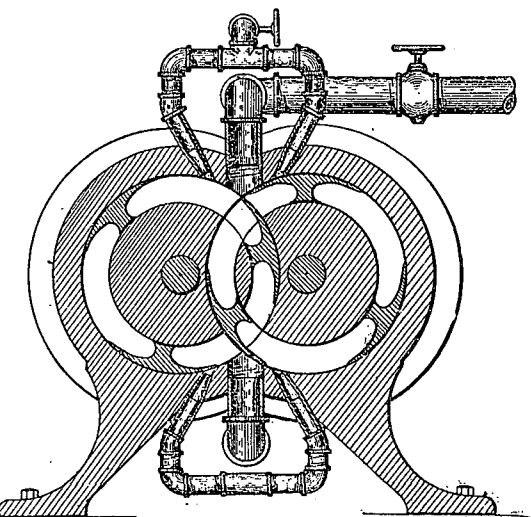
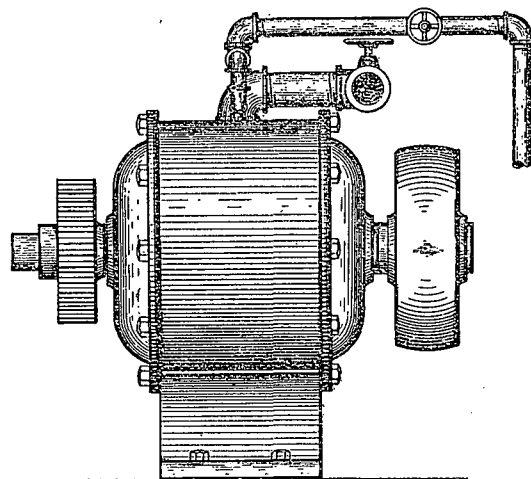


FIG. 2. (Patent Applied for.)

The heads are of such a form that in passing the two ports at the top, an impetus is received from the steam entering through the same. The engine cuts off automatically and therefore requires no governing mechanism.

The steam enters the ports alternately, thereby giving the full pressure of the steam through each port. This will be better understood by stating that when one port is closed by the passing head the other port is open, the steam striking the piston head after its passage, with full force.

One of the main advantages of the engine lies in the fact that it has no dead center, thus overcoming one of the main objections to this class of engines.

The steam expands between the heads between two and three times, thus making the engine nearly a triple expansion one. This feature shows that the improvement is a steam saver, which is a very essential point.

The shafts at one side of the engine are provided with meshing gears which concentrate and regulate the power. A drive-pulley is located upon one of the shafts projecting from the other side and from which the power is transmitted.

It can easily be seen that the engine, being well adapted for head light purposes, is easily applicable for all power transmissions. For hoisting engines, the steam connections are so placed that the engine is easily reversed.

There will be several of these engines in operation at the coming St. Louis Exposition, and a cordial invitation to examine the same will be extended to our readers and friends in our next issue, when the exact location of the exhibit can be given.

The cuts are exact reproductions of the original drawings made by the attorneys and clearly show the various working parts.

Detailed information can be had by addressing the patentee and manufacturer, Donald H. Farquhar, Odd Fellows Building, St. Louis, Mo.

Electricity on Board a Man-of-War.

The presence in New York harbor recently of the English man-of-war Blake has afforded Americans an opportunity of inspecting one of the best-known methods of utilizing electricity in the conning tower of a warship. From this situation it is possible to control the helm, the guns, the search-light, torpedoes, etc., as well as the engine room and the cabins, and the system of intercommunication is as efficient as it is intricate. The steering apparatus is made absolutely trustworthy by the helm telegraph and an instrument which consists of a dial with divisions in degrees marked on its face. A handle controlling a bar at the back has also a pointer, which indicates the number of degrees. A similar instrument is placed aft in the steering department, and the instruments are so constructed that the working of one is exactly reproduced in the other. The helm itself, controlled by another telegraph arrangement, records its movements in the conning tower, so that the commander has absolute and instant information concerning and control over the vessel's movements, and is at the same time in a position to take note of the operations of the enemy.

Electrical Data.

AMPERE.—The practical unit of electrical current; such a current as would pass with an electro-motive force of one *volt* through a circuit whose resistance is equal to one *ohm*.

VOLT.—The practical unit of electro-motive force; such an electro-motive force as would cause a current of one *ampere* to flow against the resistance of one *ohm*.

OHM.—The unit of electrical resistance; such a resistance as would limit the flow of electricity under an electro-motive force of one *volt* to a current of one *ampere*, or to one *coulomb per second*.

Ohm's law says: Current strength equals electro-motive force divided by resistance, and is expressed

algebraically, thus: $C = \frac{E}{R}$ Hence, if the electro-motive force is given in volts, and the resistance in *ohms*, the formula will give the correct strength directly in amperes.

The work accomplished by electricity is expressed in *volt-amperes*, which is the *watt*, or unit of electrical power.

One electrical horse power equals 746 *watts*;
hence H.P. = $\frac{\text{amperes} \times \text{volts}}{746}$

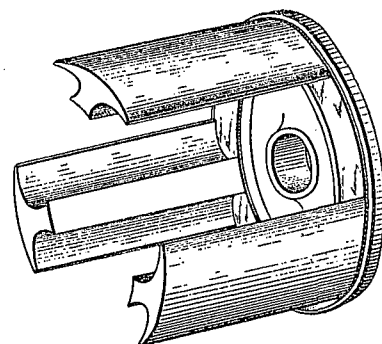
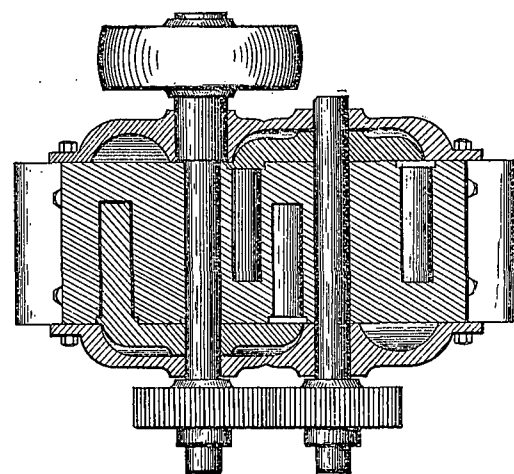
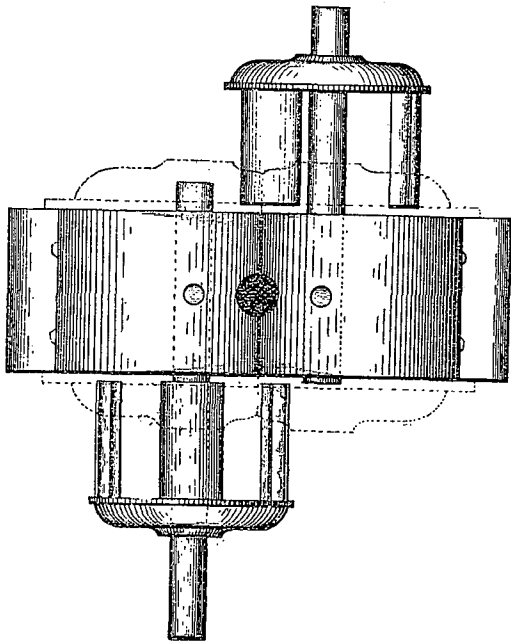


FIG. 3. (Patent Applied for.)

JUL 1893

FIG. 4. (Patent Applied for.)



EICKS & ROBINSON,
PATENT EXPERTS.
529 ODD FELLOWS BLD'G.
ST. LOUIS.

The Blackening of Incandescent Lamp Bulbs.

A recent paragraph in the *Digest*, referring to one of the theories of the blackening of lamp bulbs, namely, that it is due to the evaporation of carbon, recalls a paper by Prof. Elihu Thompson, published in a recent number of the *Lehigh Quarterly*, which shows that he has held this view for many years, his experience since then having tended to confirm his views. The paper is entitled "The Life of Incandescent Lamps," and contains a number of points of interest, some of which may not be generally known.

In answer to the question, Can a filament be made which will not deteriorate and therefore not blacken the interior of the bulb? he is inclined to think that it can not, if carbon is adhered to, and carbon as yet seems to be the best material in existence; it is so on account of its infusibility and its apparent volatility. It actually does soften at extremely high temperatures, and will bend readily when so softened. It does not melt at the highest known temperature, but it readily vaporizes in the arc lamp. It is very probable that carbon, infusible as it seems, could be fused at arc temperatures while under pressure. Thus, an electric arc in an inert gas at high pressure would probably drip melted carbon, which would form graphite in masses or crystals.

The deterioration of incandescent lamps has often been laid to the bombardment of gas molecules, but Prof. Thomson has long been convinced that in a well exhausted lamp it is due almost entirely to evaporation by high temperature. Just as ice evaporates in vacuo, so carbon acquires in vacuo a certain volatility at an increasing rate of the temperature. He assumes, of course, that the vacuum is so good that none of the bluing or visible discharge of current takes place, which of course wears the filament by actual carriage of carbon. He thinks that it would be very strange if carbon maintained at so high a temperature in a vacuum did not evaporate at all, as it is well known that almost all substances raised to a sufficiently high temperature do give off insensible vapors, and that melted metals frequently behave as mercury does at the ordinary temperature; the presence of foreign substances and gases will in some instances accelerate the action, or perhaps in other cases retard it. In a lamp a certain evaporation takes place which is independent of the size of the bulb, from which it follows that the age coating will become much less as the bulb is greater in size, for the same deposit will yield a much thinner coating of carbon over a large surface than over a small one. If one lamp were made with the smallest possible bulb and another with a large bulb, the former might be rendered opaque, while the latter would only be slightly darkened, other conditions being the same. He puts great stress on the uniformity of the filament and gives the reasons. It appears to be true, he says, that the limit of practical improvement in the efficiency of incandescent lamps is to be found in the properties of the element carbon, and particularly its volatility. It is fairly safe to say that

no other less volatile substance has yet been found, and that carbon, as pure and perfect in structure as possible, is likely to hold its place, at least for some time to come, as the material for incandescent lamp filaments.

World's Fair on the Fourth.

The appearance of the World's Columbian Exposition on the Fourth of July was most remarkable.

The number of paid admissions was 274,917, but in addition to this many thousand workmen and others who have passes went through the turnstiles, so it is safe to say that the total number of persons did not fall far short of 325,000. The crowd began to come at 4 in the morning. The gates were open to all comers at 7, and at 7:35 there was a crowd at every gate. Cable cars, elevated, the Illinois Central and excursion trains poured in a solid crowd all day. The ticket sellers and turnstile men were powerless to prevent the congestion at some of the principal gates. In many cases it required half an hour to enter the grounds, but once inside there was room for all, and the people scattered among the buildings according to their individual taste. The grounds are closed at 11 o'clock at night, but the attractions were so many, and the crowd was so great, that it was nearly 1 o'clock before the last remnant of the day's attendance had disappeared.

At noon representatives of the various concessions began to gather at the west end of the Plaisance. Many Bedouins, dressed in their highly colored native costumes, and mounted on camels or spirited horses, seemed to take the lead. A large number of Turks, with the Turkish and American colors intermingled, followed after. The people from the Cairo street were fully represented in their native gala day dress. The actors, jugglers, and other people connected with the Chinese theater appeared in their richest robes. Natives from the Dahomey village and the Lapland village joined in the procession. By no means the least conspicuous feature in the gathering was a band of Pottawatomie Indians. All these and many others formed the center of a gathering of over 25,000 most curious looking people that had gathered to commemorate the day. At a given signal the American flag was unfurled from a lofty pole, and in an instant there was a din of cheers and shouting from the assembled multitude, a salute from the British artillery, and a mixture of noises from fifes, tom-toms and a great variety of musical instruments from all parts of the world. As soon as silence once again reigned, the Mohammedan priest of the Plaisance, in his bright ecclesiastical raiment, offered prayer. The address at these exercises was delivered by Commissioner Burton. These exercises were carried out by the foreigners connected with the Plaisance, and Americans were interested in them only as spectators.

In addition to these special exercises, each concession observed the day in its own peculiar way. The German village was festooned with oak leaves. The Samoans sang "America" in their native tongue at the South Sea Island theater. The natives of the Javanese village bedecked themselves with American flags. The Chinese theater exhibited a flag upon which was written the Declaration of Independence in Chinese characters. The natives of the Dahomey village wore flags over their shoulders, and the American flag was conspicuous in the Street of Cairo, while in other concessions there was some special feature commemorative of the day. The Ferris wheel was decorated with bunting, and a brass band was stationed in one of the cars during the afternoon and evening, playing patriotic airs. This great wheel presented a magnificent sight at night, as the cars were illuminated and red fire burned at intervals, while the powerful rays of an enormous searchlight on the roof of the Manufactures and Liberal Arts Building were thrown upon it, bringing out in strong relief against the darkness the enormous proportions of the structure.

In the evening a grand display of fireworks was given from floats on the lake opposite the broad open space before the Manufactures Palace. This entire space, from the model battleship Illinois to Music Hall at the Peristyle, a distance of half a mile, was a mass of surging humanity. It was one of the finest pyrotechnic displays ever seen in Chicago. It began with a balloon, which sailed from the top of the Manufactures and Liberal Arts Building out over the lake with what appeared to be a ball of fire hanging from it. When over the heads of the multitude, this ball of fire burst and there was spread out to view an American flag, with all of its stars and stripes and colors. The success of this display was greeted with great enthusiasm by the spectators. The set piece of the evening was a portrait of Washington wreathed in laurel and adjoining the words "The first in war, the first in peace, the first in the hearts of his countrymen."

Search Light at World's Fair.

Electricity and electric effects play an important part in the many wonders of modern science shown in various forms at the World's Fair. One of the most notable features to be seen there and which is attracting no small amount of attention, is the large search light projector mounted on the north-western corner of the roof promenade on Manufactures Building. It is the largest projector ever made, and the claim is made for it that under favorable conditions the flood of light thrown from the projector can easily be seen at Milwaukee, a distance of eighty miles, which is hardly conceivable to the average mind, but those pretending to know what they are talking about stoutly maintain the truth and accuracy of the statement. What a headlight for a locomotive that projector would make! A train running between Chicago and Milwaukee, for instance, would have daylight ahead of it for the entire distance, if the condition of the atmosphere were favorable, even in the blackest night.

Perhaps the most important part of the lamp is the parabolic mirror. It has a working diameter of 5 feet, and is about $\frac{7}{8}$ of an inch thick. The labor of six months was spent in grinding and polishing this, so as to bring the glass to perfection. A thick coating of silver, protected by a paint specially prepared for the purpose, covers the back of the mirror, which is fastened in a drum by springs, so as to allow for expansion produced by the heat. This drum contains the mechanism of the lamp. It has a dull, black surface inside and out. To prevent any overheating of the mirror the drum is thoroughly ventilated in such a manner as not to affect the arc. It can also be turned in any direction, either vertically or horizontally. A dynamo in Machinery Hall furnishes the current, the feeders being conducted upward on the iron trusses supporting the roof of the Manufactures Building after passing through subways from the dynamos to the building.

Electrical Development.

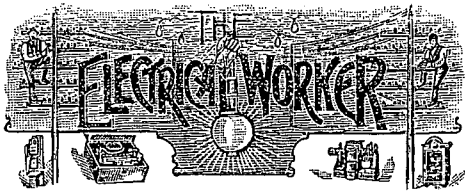
The development of electrical industries in the last few years has been chiefly due to the perfection of the dynamo as a generator of electricity rather than to the discoveries of new principles. As a machine the dynamo is nearly perfect, but behind it is the steam engine which is relatively imperfect and wasteful. If it were as efficient as the dynamo, one pound of coal would maintain an arc light all night, and a hundred glow lamps where now there are but ten. So one must look for improvements in the generation of electrical currents as well as in methods utilizing them. There is more to be hoped for from the side of chemistry and the galvanic battery, for the important elements, carbon and oxygen, are abundant enough. Now, that Dewar has succeeded in solidifying the latter, it may be that a binding-post can be fixed to it which is impossible in a gas. On the other hand, the work of Hertz and Tesla has made it appear probable that present ways of producing light may very soon be as antiquated as the tallow dip.

The wants of men have always been beyond their ability to supply them. Primitive man employed animals to a small extent, and civilized man supplements these with the power of wind, water, steam and lately of electricity. How much civilization is dependent upon these is beyond reckoning, but it is certain that safety, comfort and leisure depend largely upon making the unnerve energies of nature do our needful work.

Wind, water and steam can at best turn a crank, so their usefulness has been largely of a mechanical sort, but electricity has endowments of a higher order and is not restricted to a single talent. It can not only turn the crank of a motor, but it glows like the sun in an arc lamp; in its furnace it fuses the most refractory substances; it can freeze as well. It can talk in a telephone; do chemical work in a tank; make magnets of iron and steel; produce ether waves like light; affect other bodies at a distance; and, acting physiologically, will kill or cure a man. Such a gifted genii is not to be compared with the common cry of seivitors, and there is little wonder that everybody is as anxious as the old Athenians to learn what new thing is next to be expected. A. E. DOLEBEAR.

Wholesale Plating.

One of the most remarkable illustrations of progress in electrical appliances is electrolytic painting. Hitherto, if copper or other metal had to be deposited electrically, a bath of solution was needed. Now all this is changed, and a ship's hull can be plated as easily as a spoon or a teapot. Instead of a bath, insoluble salts, ground to a fine powder and mixed with water, are used. This mixture is painted on the metal to be plated by a fine wire brush, to which one pole of a dynamo conductor is attached, the other pole being connected to a plate. Not only pure metal, but all sorts of alloys can be used.



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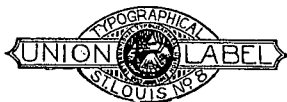
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As THE ELECTRICAL WORKER reaches the men who
do the work, and recommend or order the material, its
value as an advertising medium can be readily appreciated.

St. Louis, Mo., July, 1893.

Advertising Rates on Application.



"To play with fire
They say is dangerous; what is it then
To shake hands with lightning and sport
With thunder?"—Tyler.

The above terse quotation defines the occupation of an electrical worker better than the voluminous definition given in our dictionaries.

Not a week passes, we may say scarcely a day, that we do not read of some serious or fatal accident to an electrical worker. We should try and locate the cause of those accidents. Is it through fault of the companies in not furnishing proper safeguards, or is it through inexperience or carelessness on the part of the workmen?

The matter has never been satisfactorily settled at any of the inquests. In only a very few cases has a coroner's jury ever found that the electrical worker was killed by the current on the wire on which he was working. Very recently, in St. Louis, a jury decided that a workman was killed by lightning simply because an expert testified that 500 volts would not kill, notwithstanding the fact that a fellow-workman was killed a week previous from a shock received from a trolley wire.

It seems that all the testimony given at such inquests is from experts. Why is this? Why do not the fellow-workmen of the unfortunate man give testimony at the trial and tell the jury what they tell to each other?

Would we then have such decisions as heart-disease, sunstroke, struck by lightning, etc., etc.? Surely the claim can not be made that every man working for a corporation is prejudiced. If that claim is made by corporations it can be made equally as well by workmen in regard to expert testimony.

When a man is killed his fellow-workmen show a backwardness about testifying. They say they did not see him fall, or see how he was standing or just what he was doing, etc., and are, therefore, quickly excused by the officers of the law. Nearly all companies have adopted certain rules and regulations directing how work should be done, and it is generally decided when a man is injured or killed that he had violated those rules. Here is where the electrical workers should testify as to whether those regulations are practical or whether they were followed or not. Living up to those set rules, or at least to all of them, at a great many companies, would be equivalent to dismissal for being a slow or incompetent workman.

The mutual interest we should have for each other should prompt us to be very watchful when working on charged wires, so that should an accident occur we would know where the fault lay.

When a fatal accident occurs in a city where there is a union the union should be represented at the trial whether the deceased was a member or not and a full history of the case kept on file by the local and a copy forwarded to the general office.

We had fatal accidents reported last week from Toledo, Chicago, Jersey City and Philadelphia. We hope that the unions will investigate the matter in each case.

While 1893 has been a year of failures in the financial world, the members of the National Brotherhood of Electrical Workers have every reason to feel proud of the progress their organization has made during the first half of this year. Eighteen new Unions have been organized, and the membership of the Brotherhood has been doubled. This increase of membership has not been confined to one section, but is spread over the whole country. Now that the Brotherhood is firmly established and its objects more fully understood, a better feeling exists between the employers and the employes, and that distrust which at first existed has entirely disappeared.

To Subscribers.

We have had many complaints lately of the non-receipt by subscribers of the ELECTRICAL WORKER. In the majority of these cases the fault is with the subscriber himself, as he fails to notify us or the post office of his change of residence. This is particularly the case in large cities and after each month's mailing we are in receipt of hundreds of postal card notices from postmasters of different towns stating that Mr. "So and So" has moved and left no address. Again, Uncle Sam, himself, is very often to blame, as all publishers are aware that the U. S. mails do not take as much trouble in delivering second-class matter (as all newspapers are rated) as they should. Postmasters are very direct in this matter and often when a person inquires for mail the postmasters will look over the letters only. Therefore, to those who have their mail addressed to post offices, we would say: *Be sure and ask for your paper.* The chances are many that the paper is waiting a claimant.

To Advertisers.

With this issue we start on the first number of our second volume, and can show a gain in circulation that few trade or brotherhood papers have ever equalled. With 5000 as our initial number of copies, we have gradually increased our subscription list to 12,000 to date, and at present rate of progress will have 15,000 by January 1, 1894. We are represented by Locals in fifty-eight of the principal cities of the Union, and cover ground from the Atlantic to the Pacific, from Canada to Mexico. In many of these cities our Local takes in every electrician, dealer and worker in electricity—employer and employe alike—and as each member is a compulsory subscriber and thus personally interested in the paper, it makes the best medium for advertising electrical goods. Its circulation is larger and rates lower than any electrical paper published. Try it for three issues and be convinced you are placing your advertising where it will do most good.

To Press Secretaries of the National Brotherhood Electrical Workers.

As our local unions throughout the country have just had their semi-annual elections and as most of them have new press secretaries, we wish the latter to observe this rule: In sending in communications write on *one side of the paper only*. By so doing much time is saved in our office, as we can give the matter to the compositor without copying it.

Several members of Local No. 1 have pulled up stakes and sought fresh fields and pastures new in the godly city of Brooklyn, among them ex-President Dan Lafferty, Billy Hedden, Red Dougherty, Joe Garvey, Billy Baird, Dan Quirk, O. Piper, James Kelly. Brooklyn's gain is our loss.

Notice.

Members of the Brotherhood are warned against the following parties: H. Denster, formerly of Milwaukee Local No. 3; Frank Brewster, formerly of No. 1; big Jack McCarthy.

Inventions.

The life-history of inventions shows, at first, a gradually increasing complexity of structure, up to a sort of "clinal divide," whence it descends into a refined simplicity, which recalls—without being identical with—the germinal conception. Thus, when quadruple expansion seemed to have given the consummate touch to steam engineering, comes the surprise of the "steam turbine" of the English inventor, Parsons, having no more complexity than a Boyden water-wheel, and whose extreme fewness of parts (neither valve, piston, pitman, connecting-rod crank, nor fly-wheel) reminds one of the little steam toy of the old Alexandrine philosopher (Hero) of 200 B. C.

Recent trials at Newcastle-on-Tyne of this unique motor, under the auspices of J. A. Ewing, professor of engineering of Cambridge University, England, elicited the following extraordinary results: The consumption of steam—like at half and at full loads—is, per foot-pound, about the same as in a well-designed compound engine. It is a notable and interesting fact that this miracle of simplicity solves, at a single bound, often striven after, but never satisfactorily accomplished to himself (that is, economically) by James Watt—a rotary steam engine. Owing to its high speed and its rotary motion, the device seems admirably fitted for dynamo propulsion; and we find, that, in the test mentioned, the "steam turbin" was attached to the shaft of a powerful dynamo of the alternating current type—turbine and armature revolving together, with a velocity of 4800 revolutions per minute, generating a potential of 2000 volts, with a yield of 100 kilowatts (100 board of trade units) of electrical energy per hour. A remarkable fact, taken in connection with the high velocity, was the low steam pressure, ninety-five pounds per square inch, employed; and still another was, that, although the engine rested on a concrete floor, without hold-down bolts or special foundation, the machine ran almost without vibration. In the test mentioned the steam exhausted into a condenser—a refinement on Mr. Parson's previous structures of the same type, which discharged into the air.

GEORGE H. KNIGHT.

JUL 1893

How Patents Are Obtained.

Few persons are acquainted with the enormity of the patent system and know the extent of the work attendant upon the securing of a patent. There are but few countries now in which an inventor can not have his ideas protected, and it is gratifying to know that nearly all of the countries which have patent laws protect the inventor in his rights without exorbitant conditions or charges.

To obtain a patent in this country it is necessary, after the development of the idea, to consult some attorney who is versed in the rules of the Patent Office practice. The attorney can prepare the drawings and specification according to the necessary requirements, and file the same for the inventor in the Patent Office.

In the office at Washington are a large number of examiners, each one of whom has a certain class of articles which are under his personal supervision and care.

The applications, when filed, await their turn for examination, and the result of such examination is sent to the attorney for the inventor.

If any patents are found which conflict with the claims in the application their numbers and titles are given in order that the attorney may amend the original claims and present a new amendment for examination.

This course of procedure is carried on until the claims of the application do not conflict with any existing patents; the case is then officially allowed and the letters of patent will be issued upon receipt by the Government of the final fee of twenty dollars.

The fees required in this country by the Government are thirty-five dollars; which sum is paid in two installments; fifteen dollars accompanying application papers when filed and the remaining twenty dollars to be paid when the same is officially allowed.

Attorneys generally charge from thirty dollars up as their fees for preparing the drawings, specification and claims and prosecution of the case until issued, and it is very seldom that a case is so simple that the combined Government and attorney's fee amounts to less than sixty-five dollars.

It is well known that patents, as a rule, are of value, but it is often found, like in everything else, that many good and meritorious inventions often remained undeveloped for lack of money to push the same.

PERSONAL.

The Consolidated Engineering Co., of St. Louis, has just finished several plants in Illinois, and Hall & Einstein are now off on a well-earned vacation. They are both devotees of Isaac Walton's gentle art, and Hall has already caught several minnows and Einstein a like number of suckers. They are going to the Minnesota lakes after muskelonge and will probably come back with some electric light plants from Minnesota towns, even if they do not bring many fish with them.

C. J. Sutter of Sutter & Hisserich is in Cleveland with the Saengerfest, and as he is a great warbler the dulcet tones of his melodious voice will probably charm some contracts for electric lighting from his brother singers. Rumor says he will return via Louisville and will probably make arrangements to join the ranks of the Benedicts in the very near future.

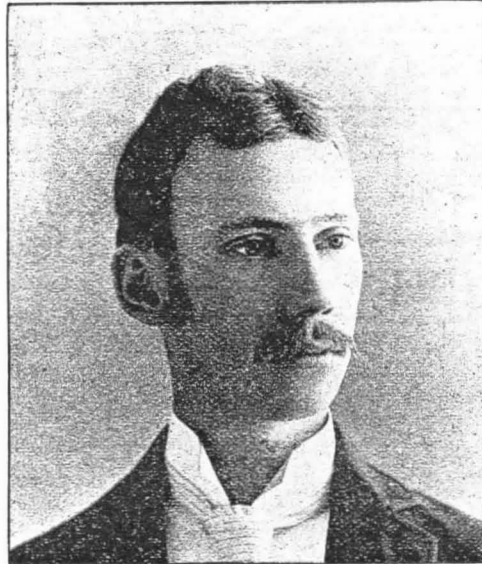
J. McC. Allen, better known as "Alphabetical Allen," of the Laclede Power Co., is a devotee of tan shoes—swears by them—and never wears any other kind. Though considerable of the howling swell, he is well up in electricity, both scientific and practical, and in the laboratory of the company can be found, while experimenting, as grimy as Tom Edison himself.

J. H. Rothamel, of the Columbian Incandescent Lamp Co., has just returned from a combined business and pleasure trip to the east. After numerous plunges in old ocean he returns invigorated to grapple with the lamp question with which he has been already so successful.

Eicks and Robinson, Patent Experts of St. Louis:

This firm, though young in business, have had a phenomenal success from the very start. They have been compelled to enlarge their office facilities and increase their clerical force and lately opened a branch office in East St. Louis.

Among other business they are now engaged in obtaining several patents that will shortly create quite a sensation in electrical and railroad circles. As will be seen from their portraits they are quite young in years, but have the reputation of thoroughly understanding their profession and doubtless have a bright business future before them.



ALFRED A. EICKS

is a son of the Hon. Herman H. Eicks, a prominent German citizen of St. Louis, and is a graduate of one of the best schools of technology in the country. For several years he was connected with the Sligo Iron Stove Co., and later with one of the patent soliciting firms in St. Louis.



HERBERT S. ROBINSON

was born in Indianapolis, and was almost brought up in the patent trade. He was some time with the Atlas Engine Works and was connected with the construction department of several of the largest electrical concerns in the country. As a writer up of patent specifications he is said to have no superior and his "Two patents better than One smile" has a hypnotic effect on his clients that is absolutely convincing.

The Atlantic Hotel, corner Van Buren and Sherman streets, Chicago, is quite a headquarters for visiting members of the N. B. E. W. The handsome manner in which the Cummings Brothers, proprietors of the cosy hostelry, entertained the delegates to our convention last fall made them many friends, and their liberal treatment of guests is in strong contrast to the exorbitant demands made by most hotels and boarding houses of the Windy City. If visiting the World's Fair be sure and call, and you will meet many of the brethren.

TRADE NOTES.

A. M. Morse & Co., contracting engineers, St. Louis, and the southwestern representatives for the Buckeye engines, report several important recent contracts for Buckeye engines, prominent among them are a 500-h. p. plant for the electric lighting station of the new St. Louis Union Depot, consisting of three tandem compound non-condensing engines, direct coupled to Siemens-Halske slow speed multipolar generators. Also an 900-h. p. plant consisting of four medium speed engines for the Alton electric street railway, Alton, Ill.

J. W. Johnson, of Detroit, is still in town, descanting on the virtues of the Logan Storage Battery. At the Home Novelty Manufacturing Company's Works, 10th and Walnut Sts., it can be seen in operation, driving machinery, lighting incandescent lamps and locomotive headlights and doing a variety of other work. Mr. Johnson has received considerable encouragement here and says St. Louis, is, above all things, an electric town.

The Ansonia Electric Co. were recently awarded the contract for the entire equipment of Stanley transformers, Helios arc lamps for street lighting, Shield brand moisture proof wire, for line wire, and other line supplies by the Hillsdale common council. This plant will have a capacity of about 2000 lights in converters and about fifty arc lamps. The Hillsdale council decided on using the Helios lamp and Stanley transformers after most carefully investigating practically all other systems on the market, and the contract was awarded by a unanimous vote.

Days' Kerite under the western management of Cushing & Moore, is having a big boom in this part of the country, and they are keeping the manufacturer, Mr. W. R. Bixey, busy filling orders. The Kerite exhibit in the Electricity Building World's Fair, is very handsome and unique.

Buxton & Skinner Stationery Co. report a large increase in this year's sales of stationery, and they have to continually increase printing plant to get out their work on hand.

As we go to press we learn that there is a new project on foot here in the shape of another Electrical Supply Co. Mr. C. G. Woods, for a number of years past connected with the Thomson-Houston Electric Co. in their railway department, and recently located with the St. Louis Car Co., is said to be one of the main stays of the new company. The new company, we understand, will be more particularly in the line of electric street railway supplies and will push to the front a number of specialties invented by Mr. Woods, and which are now well known to the trade. We extend to the new enterprise our best wishes.

Large Electrical Contracts.

Among the electrical engineers of our city, it gives us pleasure to note the success attending the efforts of some of the younger members of the profession. Notably in the front rank is Mr. E. G. Bruckman, who has achieved marked success in the electrical field, to note with pleasure that, among many contracts recently made by him, was the successful bidding for the wiring of the Union Trust Co.'s 14-story Building and also the new Union Depot Co.'s electrical plant, being the two largest electrical contracts ever let in St. Louis. Mr. Bruckman's offices on the 3d floor of the Equitable Building are conveniently situated for his immense business.

You

Can obtain a pack of best quality Burlington Route playing cards by sending 15 cents in postage to

D. O. IVES,
Gen'l Pass. and Tkt. Agt.,
St. Louis, Mo.

CORRESPONDENCE.

[The Press Secretary, though an officer of the Local Union, is really a resident correspondent of the ELECTRICAL WORKER, and should keep his paper thoroughly posted on all matters pertaining to the electrical industry in the vicinity he represents. New plants, extensions of old ones, new electric roads, state of trade, new ideas, electrical novelties and accidents are a few of the topics to report on. Please notice that the minutes of the meetings are not required, except the report of new officers, and such matter as may be of general interest to all members.]

ST. LOUIS.

July 12, 1893.

Editor Electrical Worker:

With another nail driven into my coffin by a majority of one, I am starting life again as press secretary of Local Union No. 1. Bro. Bolan, my predecessor, was certainly not disgraced by defeat. He is a very popular brother, as well as a most faithful officer. Bro. B. always endeavored to accomplish the object, and met with success. If No. 1's new officers will be as ambitious as the retiring leaders, No. 1 will come to the front as she should.

Bro. Hisserich has held office in the Union so long that every member is perfectly assured that nothing will be left undone by the president of No. 1 for the next six months. Come forward and help him. Remember, brothers, even though he is the leader, he is but one man, and a little taken by all make the burden lighter.

Bro. Pukey's popularity was well demonstrated in his re-election. Keep it up, Bro. Pukey; we will have you in the chair some day.

Bro. G. W. Frey led the race for financial secretary in good style, with no good second. Bro. Frey has held office before, to the satisfaction of all.

Although Bro. Jacobs made a number of objections, the boys thought he should have an office, so placed him in the vice-president's chair. Bro. J. is a very sensible kicker, and has a peculiar way of his own of convincing his hearers that he is O. K.

Bro. Tracey, better known as Jerry Sausage, is one of the proudest new officers of No. 1, having received a good round majority of the votes cast for worthy guide. Owing to the lateness of the hour he had no opportunity to sing the Lakes of Pontchartrain, but will give it at some future time, with variations. Do your duty, Bro. T., as well as you sing, and No. 1 will advance you next time.

Bro. F. X. Seider contested every inch for the office of worthy foreman, and carried the majority of votes. Bro. S. is very deserving of the honor placed on him. He is a zealous worker for Union No. 1, and does all he can and cheerfully.

Local Union No. 1 has displayed good judgment in its selection of officers, and the feeling seems to be unanimous that there will be much accomplished that was started by the retiring officers, but owing to time, not accomplished.

The retiring officers, every one, deserve the good will of all for the faithful manner in which they performed their duties, which at times were very trying. The presiding officer for the past term has had some very strange and difficult things to contend with, but by cool calculation and determination his ultimate decisions have shown an honesty of purpose and true brotherly feeling that deserves the heartfelt approval of all electrical workers, which was attested by Bro. Lafferty's name appearing on most of the tickets polled for trustee. Bro. Simonds came in for second place, and expressed his thanks for the honor conferred upon him, and pledged himself to perform his duties to the best of his ability.

The picnic of the season was the one given by Local Union No. 1, of St. Louis, N. B. E. W. of A. The first ticket taken at the gate being No.

132, will show that the boys have tried to sell all they could. The several committees did their share of the work as well as I could have done it myself, and you know that was well. Bro. Lafferty, as referee, could not be surpassed. He was impartial in his decisions, which was attested by the awarding of the prizes, a number going to persons not in the craft, much less in the Union. Bro. Hisserich was a very busy man, and did all that could be expected of one to make the day one to be long remembered. Bro. Johnson did the main entrance to perfection, taking in cash and tickets. He seemed very desirous of taking in more of the filthy lucre than tickets. Although in making change a mistake or two may have occurred, the Union will lose nothing. Alongside of Bro. J. and very conspicuous was the beaming countenance, good humored and faithful Bro. James Ross, at his duty heart and hand. At the side gate Bro. O'Mara held forth, and did what was expected of him. In fact, all the brothers did their share and made the grounds ring with good cheer and merriment. All contests were managed in such good order and so fairly that there was no dissenting voice. The gentlemanly deportment of the members of Local Union No. 1 is a great credit to them. Every one seemed to be enjoying themselves to the fullest when business called me away. But every one that I have spoken to since regarding the picnic say it was immense, even though cut short by the rain. Our picnic having been so successful, we hope the next entertainment that touches our craft, which I think is the excursion to be given by the employes of the Missouri Electric Light and Power Company, will meet with a grand turnout, and am satisfied will be an enjoyable affair. Come one, come all.

I am beginning to apprehend some danger to our noble cause in Cupid's antics. His arrows are flying 'round very thick, and have pierced a number of the brothers very recently. I will suggest a way of bringing our newly-married brothers forward, and that is, the poor, miserable, lonesome single brothers, not knowing what to do any evening, go to some one of the married men's houses, help them carry up coal, split kindling wood, patch gasoline stoves, or any one of the numerous little jobs that bothers their minds, and then they can have no excuse to remain away from Union meetings. Remember, brothers, we meet every Tuesday evening at No. 305 Olive Street, and our grand secretary and treasurer and the ELECTRICAL WORKER can be found in the same office in the Emilie Building, southwest corner of Ninth and Olive Streets.

As there was no meeting on July 4th, can say nothing. I have to kick again on what I think an important matter, and that is the practice of canning beer. There is not so much harm in the simple matter of getting beer in the growler, but the publicity some of the brothers give it looks bad, to say the least of it. On Sunday I had occasion to look up one of the brothers on business. I called at one of the regular resorts, and the first brother I caught sight of was almost out of sight behind a can of beer, and the second brother had foam on his mustache. This happened on the open street, where and at the time when good people were going to church. I would suggest, if you must have beer, take it to some place not so public as the thoroughfares. We must begin to reform, as our constitution will have to undergo some changes soon, whereby we can admit ladies, for the darlings are fast taking the art in many ways out of the hands of us coarser beings. Then we will have to put on our prettiest shines.

I have a whole lot more that I could say, but am afraid to intrude too long on the brothers and take too much of the valuable space in the ELECTRICAL WORKER.

With brotherly regards, I am,

Your servant,

W. L. PEEBLES,

Press Secretary.

MILWAUKEE.

JULY 6TH, 1893.

Editor Electrical Worker:

Number 2 has got most all of the inside wire men in the city. I believe we have all the outside men, a number of dynamo tenders, and still looking for more. We have received fifteen new members the past month and have applications from four armature winders. We are taking in all who are making a living off the jincey waves that nobody has ever seen, but, I hope it will not be long before every member of the brotherhood will have as good an account to give of it as Edison, Thomson and a few more of the men who are today what we can be in the near future if we only assist and instruct each other in whatever branch of the trade we are at. The Wisconsin Electrical Construction Company's men have all got eight hours, also the Pabst Heat, Light & Power Company's men. The Pabst plant is a Siemens-Halski, and in my estimation is one of the best in the country. They will shortly start to lay a commercial line for the principal east and west sides. The Wisconsin Electrical Construction Company are going to put in another Siemens-Halski plant in Depere, Wis. They will have one of the finest show rooms in the northwest located in the new Pabst power house. Bro. Peter Keelan has just finished the inside wiring; he is the fattest inside man we have.

Please mention July 16th as the date of our picnic; you did not have it in your last issue. We intend to have a model picnic and have a few attractive specialties that no other Union can have and make a success of unless some of our stock got mixed up in them.

Hoping to have something better for your next, I am,

Yours Fraternally,

MIKE J. QUIRK,
Recording Sec'y.

NEW YORK.

JULY 4, 1893.

Editor Electrical Worker:

We are enjoying a very pleasant "Fourth." Good air, plenty of sunshine and the thermometer at 79 at mid-day in the shade. It is a perfect day--such a day as we like to picture to ourselves when we think of those brave men that brought forth the day we celebrate.

The thoughts that creep into our minds relative to the existing conditions as we try to extract from the Declaration of Independence its sterling truths and apply them to our times, reveals an activity among the bread winners in our trade that speaks well for the future.

The intellectual force that every employer seeks among his employes is one of the potent factors in our trade that is bound to establish it upon a very high plane. We see, with all others in our calling, that if, when the application of electricity for domestic uses was made a commercial success, the tradesmen had made the same tireless efforts to pool their issues, foster monopolies and create trusts, as were pursued by the managers of the corporate interests in the electrical industry, our name to-day would be legion and our movements and contemplated actions would be as well watched and as carefully chronicled as the price of stocks of the General Electric Company or the American Bell Telephone Company.

But away with philosophizing; let's get at it now and profit by the work of others. Let us all put a little of that pent-up intellectual force and mechanical skill that is so readily obtainable by our employers at prices ranging from car fare up to \$25 per week, into our locals, and let the second half of 1893 show a good growth all along the line.

We note with pleasure that the old firm of A. G. Newman has granted to its employes the Saturday half-holiday for the months of July and August, in accordance with the custom established in the summer of 1890.

Our readers this month are treated with an introduction to a new departure in the electrical

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construction line, under the name of the New York Electrical Repair Company. This house has a Government contract for the equipping of the old-time battleship, New Hampshire, with a modern electric lighting plant. This is the ship that has been set apart for the training of the naval reserve. She is as staunch to-day, after being afloat 70 years, as the oaks of the forest.

We offer the suggestion that it would be well to publish in the WORKER the Fire Underwriters' rules of a few of the leading cities and insurance exchanges. Every advanced electrical worker knows that every act in the installation of electrical apparatus involves a fire risk, and if we can instill in the minds of the rank and file of our trade the necessity for a strict observance of the above rules, we thereby become a blessing to the public and the contractors in general, and to the insurance companies in particular.

One of the striking occurrences of these days is the rapidity with which new methods of new appliances find their way into the trade. Work that was installed in this city three, four and five years ago under the most favorable circumstances is to-day being overhauled. During the past six months the Eden Musee has had a complete renovating by the Paul Lemaire Company, the work having been originally installed by the United States Electric Lighting Company, and kept in repair by Bateman & Pollard for a number of years. The Madison Square Garden, which was equipped by the Edison Illuminating Company three years ago, is being rewired by the management of the garden. The magnificent club house of the Central Turn Verein, that the Tucker Construction Company wired four years ago, is to be entirely overhauled by the New York Equipment Company. We presume the dear public, that pays for all this, often says, in the language of the distinguished Georgian, "Where am I at?"

The regular semi-annual election of Local No. 3 took place last Thursday evening, June 29th. The following-named brothers were duly elected: W. Ivory, president; W. Watson, vice-president; G. Middleton, recording secretary; C. Ingham, recording secretary; D. Murphy, inspector; S. Keating, foreman; F. McCann, trustee, 18 months.

Yours, fraternally,

C. W. HOADLEY,
Press Secretary.

213 Willis Ave., New York.

NASHVILLE.

JULY 13TH, 1893.

Editor Electrical Worker:

Well, as the election of officers is over and the boys have concluded to give me one more chance, I am still Press Secretary of No. 5.

The boys were so well pleased with Brothers Prang and Wilcox, they were re-elected to their old offices of President and Vice-president.

Financial Secretary Morrison was also re-elected.

The office of Recording Secretary fell to the able and efficient Brother Edward Farwell—"good bye" for short.

Brother Isaac Borum will inspect all circuits and report all trouble, while the honorable Burgess, Horatio Smith, will, with his usual "eclat," hold down the office of Foreman, while Johann Carlos Bender will act as Trustees. The above selections were made after a careful inspection of the timber on hand, and we expect great things from them. Gus Prang is "at home" to his friends in his new quarters at No. 1 Station.

Visiting Brother Williams has returned to Chicago. He made a number of friends while here who wish him success.

The plant at the new County Asylum is nearing completion and it is all that art and fine workmanship can make it.

The contract to wire the Custom House has been let to J. W. Baird, who will begin the work at once. This will be a great relief to the employes of the Post Office, who have heretofore had to swelter under the intense heat of gas.

Brother W. W. Pohlman is suffering from a severe contusion on the head caused by a fall. He will be all right in a day or two.

We intend to make "Rome howl" here Labor Day, and arrangements to celebrate this holiday are already being made.

The annual convention of the Retail Clerks' National Union met here on the 11th to the 13th inst. Fully fifteen States were represented and there were about 100 delegates. The local branch entertained them right royally and their visit to the Athens of the South will long be remembered.

We are to have a new departure at our meetings, namely, blackboard lectures, which will supply a long-felt want and demonstrate the fact that we meet for something else besides "chewing the rag."

Bender and "the professors" are a great team. The professor drank a glass of water last week ("by mistake of course") and he has not yet entirely recovered, and Bender, "there's the boy," you ought to see him do the skirt dance at a German birthday party the other evening.

Burgess—Horatio Smith—has been sick the past week, but as it is nothing more serious than a case of cholera or something of that kind, he will be all right in a day or two.

All the new officers were installed at our last meeting, after which a pleasing programme of vocal and instrumental music was rendered and refreshments served.

I would like to say to the members of No. 5, that there is too much "playing at cross purposes" amongst them, and if it does not cease trouble is bound to ensue.

Brother Isaac Borum is the "good old man" of the Union. He don't say much, but there is a twinkle in his eye that says very plainly "no foolishness."

Blossom Morrison reads his constitution every night before retiring, and "woe be unto him" who misquotes it. His motto is, "give me my pipe and my constitution or give me d-e-a-t-h."

I have before me a souvenir paper-weight of the Electrical Building at the World's Fair, presented to me by my sister, who has just returned from a visit to Chicago.

The electric light boys challenged the telephone gang for a game of ball, but when they found out that Prang and Langdon were the opposing battery, they declined to play. Happy thought!

Jack O'Neil makes himself very conspicuous at our meetings by his absence.

As a finish, I will say, please mail me a copy of the June WORKER, as the limited number of copies you sent were gobbled before I could get one.

Crafternally,

P. H. LANGDON,
Press Secretary.

CHICAGO.

JULY 10, 1893.

Editor Electrical Worker:

News electrical in Chicago is scarce. The hurry and rush of all kinds of labor to complete the improvements that Chicago has made for World's Fair times and to create the wonderful White City and start it in operation has ceased, so that now, when times are not so speedy as they were this spring, when every one had to work overtime and draw a stake every week, the boys are disposed to think, with many of us out of work, that times are very rocky indeed. We must remember that present circumstances are precisely what was to have been expected, and that Chicago can not maintain permanently the large number of electrical workers who were called here to finish the World's Fair work.

We may be proud of the fact that within a year several hundred men have first seen light at the meetings of No. 9, and are now going out as union men to work in all parts of the country with brains full of everything which is best in electrical construction and hands skilled for the work. For Chicago has been a good school for the boys the

past year, and a study of the exhibits in the Electricity Building and the immense plant for lighting the grounds of the Fair is an education in itself. We welcome all visiting brothers to the Exposition and to our headquarters at No. 199 East Randolph Street, but we advise no electrical worker to come here expecting to find work.

Our election was rather exciting, but was a walk-over for the best man for each place except the vice-presidency, which Bro. Cooney captured on the fourth ballot. Geo. Edison was re-elected president.

We think six months is long enough for the presidential term, notwithstanding some opinions to the contrary, and then if a Union has a president who has proved him worthy, it can show its appreciation by voting him another term.

In the Cold Storage Building fire at the Exposition on the 10th inst. our Bro. Norman M. Hartman, foreman for the Harter Electric Company, was burned to death.

C. E. Bogan and P. F. Barnes left on the 10th for St. Augustine, Fla., where ten of the boys are at work on the Hotel Ponce de Leon. They will work at the Hotel Alcazar, south of where we believe Bro. F. M. H. Green is foreman. So one by one they leave us.

L. L. JOHNSON,
Press Secretary.

CHICAGO.

JULY 5, 1893.

Editor Electrical Worker:

You will doubtless be surprised on receiving a report from No. 9, but I can safely say that the WORKER shall not have to ask again if there is such a person as the Press Secretary of No. 9 in existence. The boys of No. 9 have had a lively time for the last two weeks—the election of officers for the ensuing term took place Saturday Eve, June 24th, and a very exciting one it was. President Geo. Edison was a candidate for re-election. The New Yorkers at work at the Fair Grounds have conceived a violent dislike for Brother Edison and the affection is reciprocated. The immigrants from Manhattan Island were determined that No. 9 should be manned by a new set of officers, and, re-enforced by a considerable number of "Locals," they nominated Brother Tom Finnell, the ex-president, for president. Another small faction nominated Brother Cooney. This was evidently a ruse to keep some of Cooney's friends from voting for Finnell. Considerable interest was manifested in this election, and when the tellers announced the result—Edison 63, Finnell 36, Cooney 18—there was such a yell that the "scab" clock on the wall was struck dumb with amazement and stopped until the vagrant eye of Brother McNulty brought it to its senses. The election of Brother Edison was very properly made unanimous.

For vice-president Brother Cooney and Brother Sockman was placed in nomination. This contest proved more exciting than the first; it required three ballots to decide it. The third ballot standing 70 for Cooney, 63 for Sockman. Brother Sockman would undoubtedly have been chosen but for a general desire to give the vice-presidency to a line-man. This feeling and this alone is what elected Brother Cooney. Brother Sockman has reason to feel proud of his vote; it showed his popularity among the workers. To have your friends "stick" to you without any solicitation whatever, as it was done in Charley's case, is an honor. Though declared defeated he polled as many votes as Brother Edison. This election, unlike the first, was not made unanimous. A peculiarity of the final ballot was that 133 votes were cast, while there was but 125 Brothers in the hall, which plainly shows that No. 9 has members who are acquainted with the mysteries of legerdemain. This ended the excitement; the crowd rapidly left the hall, and those remaining proceeded to re-elect Brother Capps, Financial Secretary. Brother Capps was on the anxious seat for the last few weeks; his resignation was in the hands of the Union and he could not

be relieved from the onerous duties of Financial Secretary any too soon, but, like the kind, generous Brother that he is, he consented to be taken in "out of the wet" for the next six months at \$18 per week. If that ain't generosity I don't know what is. Brother Sauers, as faithful a worker as there is in the National Brotherhood, was elected Recording Secretary. Brother W. J. McKinney will be inspector for the next term.

Brother Smith will have a rocky road to travel as trustee, and Brother — will grace all meetings as foreman. Brother McNulty, Brother Griggs and Brother Stratton will be our delegates to the Building Trades Council, with the aid of some of Jerry Sullivan's "oratory." If Brother McNulty does not let some one know that the electrical workers are represented by a person who knows what we want and has the courage to demand it, then I'm a poor prophet. The result of the election is very pleasing to those who have been initiated into the mysteries of the 33rd degree, but to those poor unfortunates, those automatons who at intervals are heard aye or nay, as the case may be, it will undoubtedly prove disastrous. It is considered a vindication of the course pursued by the old officers for the last term; it is unquestionably a vindication for Brother Edison, but the question is not one of personal gratification but has the Union been benefited by Brother Edison's vindication. Time will tell. It would have been better policy to elect one of the minority to some of the offices, but this was not done. The minority was trampled upon. Not a single person who voted against Edison was elected to office. This was a great mistake, but what does a mistake like this count for when "vindication" is at stake. One thing is very certain, No. 9 is rapidly approaching a crisis and it will require more skillful piloting than it has been receiving to keep it afloat. Our strike is still on, and according to the present outlook it will be quite a while before it will be won or declared off. It could be won in ten days if the electrical workers should prefer to handle any other than an Edison lamp or cut out or wire. Well, this is about all the news from Chicago at present. Hoping to hear in your next issue that No. 1 had a fine day and splendid time for its picnic,

I remain, yours fraternally,
No. 9.

INDIANAPOLIS.

JULY 6TH, 1893.

Editor Electrical Worker:

It is some time since you heard from No. 10, but we are still alive and growing very rapidly. Brother Ed. Boyle, formerly of Albany, N. Y., later from St. Louis No. 1, has deposited his card with us. Brother Ira Huston of No. 11 has his card with us; also Brother M. H. Cook.

We have just initiated one wireman and one trimmer and have applications from three more.

Brother Pat Fanning, Superintendent Indianapolis Fire Alarm, fell from a ladder, but as it is hard to kill a good man he got off with a broken arm. Brother J. P. Berry, of Chicago No. 9 was in town for a day or two last week. I am instructed to notify, through the columns of the ELECTRICAL WORKER, all members of No. 10 to attend meeting once a month or be fined, so they must govern themselves accordingly. The following officers were elected and installed for the ensuing term: President, Jack McCreary; vice-president, Wm. B. Burford; treasurer, J. Carrol; financial secretary, Chas. Neal; recording secretary, Lee Hart; press secretary, D. A. Greenwood; guide, C. Huntzonger; doorkeeper, P. Dorsey; reporter to Building & Trades Council, Wm. B. Burford. Notice is hereby given to all Union men to not recognize one George Bowers, as he was thrown out of our local for conduct unbecoming a Union man, and was also fined \$100.00.

A man from the "city of trouble," Terre Haute, giving his name as Geo. A. Johnson, arrived here while we were having trouble and goes to work for the company. The understanding over here is that

he scabbed it at Terre Haute, as one of our brothers saw him working there. Anyhow his rope here was very short. He was weary, and one fine evening he took the State House steps for his couch and laid himself to rest on the soft side of the stone, and, so the story goes, was soon in the arms of Morpheus; and ere he had his first hour of beauty sleep was rudely awakened and gathered into the arms of a burly policeman. He was arrested as a suspicious character, and on searching him a pair of brass knucks and a horse pistol were found in his possession.

This Thursday morn he told his troubles to the Judge, and they were long and full of woe. The Judge was flinty hearted and cut him short thusly: "Young man, an honest man may carry a revolver, but when it comes to carrying a horse pistol and knuckles you evidently want blood. Now, I usually give \$500 fine for a case like yours, but this time I will let you down easy with \$300. Next."

Fraternally,

D. A. GREENWOOD.

EVANSVILLE.

July 10.

Editor Electrical Worker:

No. 12 is still in the ring though the hot weather is crowding us pretty tight to keep cool.

We have had our regular election of officers, with but little change. The same old stand-bys elected again. Bro. Riggs takes Bro. Wilkies' place as financial secretary and Bro. Phefflin foreman, in place of Bro. Grant, and "Yours Truly," in place of Bro. Earnst as press secretary.

Now, in the first place, I have a kick coming on our WORKER. Quite a number of our boys do not get it regularly. Some of them got the first two numbers and none since. We would like to know where the trouble lies.

I see in The ELECTRICAL WORKER in several places the boys are having a great deal of trouble with their contractors. If they were all like ours they would not have very much trouble. Blessed with good union men in the electric line they do all they can to help the cause along. I wish they were all like them.

The enterprising and hustling firm of J. B. Green & Co. are holding their own this hot weather. They have just finished up a complete plant of arc and incandescent on the fine new steamer, Jewel, which plies between Evansville, Queensboro and Henderson, and are now putting in a plant for the Evansville & Terre Haute railroad.

Bro. Green has put in over forty fans and is looking around for a pocket battery strong enough to run 1—8-horse power fan so that he can hitch it on, as he has no time to stop and get cooled off.

Bro. Masters has been lying on his oars for a while, but he is getting there just the same.

Bro. Hill is hustling around keeping himself busy.

This hot weather don't seem to bother the boys very much, as they seem to turn out about as usual and are all busy.

Bro. Olney May returned from St. Louis and reported very rough times while there, at the hands of Local Union No. 1. We would like to get at the bottom of this affair. Please give us some light on the subject if you can.

Every brother is working now, and I think in a month or two the street-car company will build about six or seven miles of electric line. If any brother wants to know anything in regard to the street-car company, tell them to write to Lawrence Riggs, No. 416 Upper Fourth Street, foreman.

Fraternally,

C. H. BROWN;

Press Secretary.

CLEVELAND.

JULY 8, 1893.

Editor Electrical Worker:

No. 16 is progressing steadily, and from the interest taken in our organization we look for a great many more members in the near future. We have

had a number of visiting brothers lately, and as all have secured work here we have been pleased to add them to our number. There is not much new work at present owing to the delay in the proposed railroads getting started, but when they begin business had ought to boom for some time to come. Our shops are running very slack for the past month, but are now beginning to show a little more life, and as all our members are working we have had no cause for complaint. At the last election of officers unusual interest was manifested, our hall being crowded to its utmost and some of the officers elected by a very small majority, which speaks well for the Union. Ability and faithful attendance were taken into consideration in choosing our officers for the next term, and believe we are second to none in the national organization in this respect. If other locals would do the same and have their officers set an example to the members we believe they would be able to secure larger attendance, and members would take more interest in the business of the Union, which would do away with so much complaining. At least we have found it so in our case, and would advise other locals to try the same remedy. Hoping to hear that other locals are situated as we are, I remain,

Yours, etc.,

N. DUFF.

DETROIT.

JULY 10TH, 1893.

Editor Electrical Worker:

Brother John Daily, formerly of Cleveland, has become a member of No. 17, having been admitted on a card issued by No. 16.

Rumor places the date of Ex-president Shuart's marriage (which was announced for a date in June) at October 25th.

Brother Joseph Campbell is said to have serious intentions of becoming a Benedict sometime during the month of August.

Brother J. P. Asam has secured a position as trimmer for the electric light company of Toledo.

Brother John J. Smith has left his position with the Detroit Electric Light and Power Co., where he has been for over three years, and now wears the blue uniform and brass buttons of the Metropolitan Police. We believe John will do credit to his new position.

The three-year contract of the Detroit Electric Light and Power Co., for public lighting, having expired July 1st, said company is now doing the work from month to month, and will, no doubt, continue to do so until the municipal plant can be got ready for business.

On Saturday evening, the 8th inst., William Parker, a night patrolman for the Detroit Electric Light and Power Co., was killed in front of his mother's house at the corner of First and Spencer Streets. He had ascended the pole-light to make some necessary repairs, and while thus engaged, suddenly stiffened, and, with a groan, fell to the ground and expired a few moments afterwards. Examination showed that he had worn buckskin instead of rubber gloves, on this occasion.

Brother J. S. Eastland was laid up a couple of weeks with a painful cut near his right knee, caused by the head of a hatchet which a fellow-workman was using, flying off and striking him. After he had about recovered Brother Eastland and Brother G. Dunlap went to London, Ont., where they expect to be engaged for about six months putting in an incandescent electric light plant.

On June 22nd, No. 17 elected officers, but owing to certain irregularities in the proceedings the trustees protested against such illegality and called for a new election. This was held on the 6th inst. and resulted as follows:

President, T. Shuttleworth; Vice-president, Robert Elliott; Recording Secretary, W. C. Shuart; Financial Secretary, S. K. King; Inspector, Chas. Lapworth; Foreman, J. T. Kinchular; Trustees (to fill two vacancies), Chas. Lapworth and A. Armstrong; Trades Council Delegates, T. Shuttleworth, Chas. Lapworth and F. A. Klein; Press Secretary, T. Shuttleworth.

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THE ELECTRICAL WORKER.

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The Electrical Commission have engaged Alex. Dow of Chicago, to act as superintendent of the proposed city electric light plant. His salary will be \$3000 per year. The commissioners have also appointed a committee to ascertain on what terms the Walker property, at the foot of Bates Street, and the Cooper property, near the foot of Rivard Street, can be purchased for a power house; also to get figures on the towers of the Detroit Electric Light and Power Co., with a view to their purchase for the city.

During the severe storm of Friday night the 7th inst., the 150-foot Brush electric light tower at the corner of Fourteenth Avenue and Magnolia Street, was blown down, owing to the guy posts rotting at the surface of the ground. We consider it about time some action was taken to compel the company owning these structures to either render them safe against possible overthrow or remove them from our streets, as this is either the fourth or fifth of these towers which have blown down within the past three years, during which period they have remained dark and dreary, as silent evidences of the defeated ambition of a grasping corporation. They number about 135, and, together with about 100 belonging to the Detroit Electric Light and Power Co. (which latter are in use), make quite an iron forest of our streets.

KANSAS CITY.

JULY 7TH, 1893.

Editor Electrical Worker:

As this is my first effort in literary work I hope due allowance will be made for mistakes, and that this will not be consigned to the waste basket. It is rather embarrassing to make a start in a journal that is so popular and has so many critics.

Number 18 is still running; we have got a few grounds but are gradually burning them off.

The regular election and installation of officers was held last Friday night.

Bro. Roth, late of the Edison Electric Light Company, and Bro. Quigg have coupled up and are running direct under the firm name of Quigg & Roth, dealers in electrical supplies. They are located at 16 East Eighth street, where any of the brothers will receive a cordial welcome.

The Telephone Company has laid off about half of their linemen.

The Kansas City Electric Light Company has also laid off most of their linemen, scarcity of work being the cause.

Ben Burns, who went to Illinois with S. McCracken, has returned.

Bro. Shaw took out a traveling card at our last meeting. He will probably be enrolled on the books of Number 1.

With best wishes for the continued success of the National Brotherhood of Electrical Workers,

Yours Fraternally,

J. M. ROSE,
Press Secretary.

WHEELING.

JULY 5TH, 1893.

Editor Electrical Worker:

It has been some time since you heard from me through our valuable paper, but having been elected to the position of press secretary will hereafter endeavor to keep you posted in all the electrical work through this section as well as posting you in regard to the doings of Number 21.

We held a very exciting election on June 24th, and the result will enclose you.

We re-elected for president, Bro. C. L. Ullery, a man who has always earnestly worked for the best interests of the brotherhood; for vice-president, Bro. J. C. McCready, a member who will prove himself worthy of the position; Bro. J. F. Barnett as recording secretary will never be caught without pen, ink and paper to jot down the proceedings of the meeting. But, worthy editor and brother, it

pains me to think that Number 21 made a mistake in selecting her financial secretary. Of course I had a vote and like all live politicians used that vote for myself, hence the election of Wm. C. Prickett for financial secretary. They added to their mistake by electing the same Wm. C. Prickett as press secretary. For trustee, our worthy brother Geo. A. Wood. The crowning event of the evening was the election of inspector. The brother with the longest pole knocked the persimmon, none other than the lengthy sweetness, Bro. C. Dotson. For foreman, Bro. Jas. Wagner, than whom there is none more ready to work for the interest of our union. Delegates to Trades Assembly were Brothers Prickett, McCready and Ullery. After election the officers were installed, and then after all business was transacted an impromptu lunch was given by the newly-elect and partaken of with gusto by the members of Number 21.

In regard to work throughout this part of the country it is very quiet at present but promises to improve in a month or so. Our boys, however, manage to keep at work. There will be eight miles of railway to build across the river, and the Wheeling Electrical Company will also extend their lines. Will give more particulars in our next.

I would like to say a word or two in behalf of the boys in general. Brothers, remember your obligations and use all honorable means of bettering the brotherhood. Elevate yourselves by paying close attention to your work; there are always new points that come up that will give you chances to study. Do not forget these things; remember all you can of them and search for everything pertaining to each "new pointer" you may become interested in. In this manner, you assist your memory and educate yourselves. A man may be a station worker all his life and know nothing more than the theory of his work if he does not study the "whys and wherefores." He may be able to take care of his engines or machines, set brushes, etc., year in and year out, but if he makes no study of why he does "thus and so" he will never advance to a higher position. If you are bothered about some certain part of your work procure some electrical work on the subject and keep reading and reading everything about it until you have thoroughly mastered it. Ask your own journal, the ELECTRICAL WORKER, anything pertaining to your business and some of the brothers will answer. In this manner you will not only help yourself but all your brethren.

Hoping to hear from all brothers in next issue in regard to some knotty point they do not understand, so that we may debate it in our own paper, we are,

Fraternally,

PRESS SECRETARY NUMBER 21.

OMAHA.

JULY 6, 1893.

Editor Electrical Worker:

No. 22 is now in good shape and on the high road to prosperity. Business is dull in town, but no union men are out of work. The Telephone Company's subways are nearing completion, the cables nearly all strung. In obedience to order from the city electrician the Electric Light Company are removing all convertors from frame buildings and putting them on poles. The insurance companies say all convertors must come out of basements and cellars. There are only a few such places. This and the taking convertors off of frame buildings will keep their linemen busy for some time. When any of you come to Omaha we want you to take a look at our outside construction. We think we do about the neatest work in the West. The East Omaha Motor Company have extended to Courtland Beach and will probably put up a power-house of their own next spring. Work on the new bridge over the Missouri River at East Omaha is going on rapidly. Fraternally,

F. M. VAN DERVOORT,
Press Secretary.

ST. PAUL.

JUNE 20TH, 1893.

Editor Electrical Worker:

At our last meeting, June 13th, we elected officers as follows:

President, G. W. Ellis; Vice-president, J. Roadhouse; Financial Secretary, F. A. Zimmerman; Recording Secretary, Wm. J. Bell; Inspector, Chas. Zarbough; Foreman, R. Davenport; Treasurer, Joseph McAuley; Trustee, Frank Volk; Delegate to Trades and Labor Assembly, A. Dozier; Press Secretary, W. A. Bell.

Our new president is competent and able to give us a first-class administration. We look forward to progress under his supervision; he is also a practical electrical worker.

We extend to our retiring president, Mr. Joseph McAuley, our many thanks for the labor he has performed from the time of organizing of Local Union No. 23, as he has been its president since and has had much to do in placing it where it is now—on the road to success. We also elected and recommended to the Trade and Labor Assembly—who, in return, will recommend him to the Mayor and City Council, Mr. E. T. Jones for City Electrical Inspector. An appointment is liable to be made soon and we all hope to see Mr. Jones appointed, as he is a practical electrician and a good electrical worker, with special qualifications for such position. We also changed our meeting night from first and third Wednesdays to the second and fourth Tuesdays of the month. We also intend now to make special efforts to reach a certain class of men which have been as yet backward; also strangers. We have a standing committee to look them up and bring them in, if in position to be accepted. I believe our organization can be made much better by such a course in each city. If a stranger comes make him aware that we, as a union, exist. He will also wish to exist and be with us.

I am sure the Electrical Engineering and Supply Co. of this city are about to move to Minneapolis. They are large dealers in electrical apparatus.

The electrical business is somewhat quiet now but I believe owing to the financial situation, as in other business. As soon as some settlement of that question is made we will flourish as never before in our city and surrounding country, as competition is getting quite brisk here now and many companies are reaching out for trade in this part of the Northwest. Fraternally yours,

WM. A. BELL,
Press Secretary.

WASHINGTON.

JULY 6TH, 1893.

Editor Electrical Worker:

I take great pleasure in informing the brothers of the National Brotherhood Electrical Workers that No. 26 of Washington is still in the ring, and we are there to stay. We are not going to get at loggerheads with our bosses, for the majority of the first-class bosses are favorably disposed towards us. We won them over to our side by publishing what we call the Union Circular every month. On this circular we give the name and address as well as the telephone call of the firms who employ union men. By this means we have succeeded in keeping a number of jobs out of the hands of scab shops, and we find that in this way we have won the good will of the bosses.

Among the non-union shops of Washington are John Galloway, Tenth St., N. W.; The Bliss Eng. Co. of Seventh St., N. W.; Jordan & McLeod of Tenth St., N. W. These firms now are employing scabs. There are a number of men in our city who have not as yet joined our circuit but who may see by-and-by where it will be to their benefit to join us. Union No. 26 has raised its fee from two dollars to five for admission. We are going to hold our first grand excursion to Marshall Hall on Monday, Sept. 4th (Labor Day), on which occasion they are going to have games of all kinds,

together with athletic sports. The committee on athletic sports and games met at Brother Jas. M. Berger's, 805 M. St., N. W., on Sunday, July 2nd, and decided on the following sports: A handicap bicycle race, open to all comers, offering a silver cup as a prize to the winner. Also a bicycle race among the members who can ride a wheel, a silver medal being the prize for the winner. Also foot races, boat races, sack races, sparring matches and swimming matches. For each of the races and matches there is to be a silver medal given to the winner. In the evening there is to be a vocal and instrumental entertainment. Between the scenes, also a musical sketch and select readings. The local expects to sell about 1500 tickets for this excursion, and hopes to increase the funds in their sick fund.

On Friday evening, June the 30th, we elected the following officers for the ensuing six months, as follows:

Brother A. Mann, President; Brother G. A. Malone, Vice-president; Brother J. Frank Sheridan, Recording Secretary; Brother J. Leach, Financial Secretary; Brother M. S. Beaton, Treasurer; Brother Jos. Collins, Inspector; Brother H. Phillips, Foreman, and Brother R. Metzel, Trustee in place of Brother Geo. A. Malone; Brother Jno. M. Berger was elected Press Secretary of the union.

The members of Union No. 26 tender their thanks to the retiring officers, they having performed the duties of their offices with untiring zeal, devoting all their spare time to the interest of the local.

Among the work that has been done in the city lately is the residence of Justice Brown, corner Sixteenth and Riggs Sts., N. W.; the work was done by C. Schneider of 1207 F. St., N. W. The building is tubed with conduit tubes cased in brass, making a fine appearance. Mr. Schneider's shop is the only strictly union shop in our city, the rest employing from one to three and more men.

Business in our city is not as bright as it might be at this time of the year.

Roace & Marein have secured the new Post building on E St., and also several jobs in the U. S Treasury; they employ about six members of our union.

I will close this now for fear of taking up too much of the brothers' time talking about things in Washington, but the brothers can look for papers nearly every month on practical electric subjects over the signature of

Fraternally,
JNO. M. BERGER,
Press Secretary.

BALTIMORE.

JULY 6th, 1893.

Editor Electrical Worker:

No. 27 elected an entire set of new officers last meeting night, except president and treasurer. President Russell was re-elected, also Treasurer Merrick. The following officers were elected: S. H. Jackson, Vice-President; S. Wilcox, Financial Secretary; Geo. W. Spillman, Recording Secretary; R. Coulton, Inspector; H. Bierman, Foreman; C. W. Davis and Geo. W. Jackson, Trustees; J. P. Jones, Press Secretary. The corps of officers elected are a staunch set of good, reliable union men, who believe in standing by the union and brothers. It is advisable for inside wiremen to steer clear of Baltimore, as inside work is very scarce; quite a number of our men have left town on that account, though good climbers are in demand, there being quite a lot of railroad work going on, also line work. We are at every meeting adding new lights to our grand circuit, and in the near future I can safely say, we will have all the best electrical workers in Baltimore installed in our Union. No. 27 is certainly growing, thanks to our untiring union workers. We will have our first venture in the excursion line July 17, at Tolchester Beach, a beautiful and lucrative resort on the Chesapeake Bay, and hope to send you a good report of it for your next issue, as quite a number of tickets have already been disposed of.

One of our brothers was scorched a little by fooling with the business end of a live wire and an offensive looking gas-pipe. He will know better next time.

Fraternally Yours,
JOHN P. JONES,
Press-Secretary.

PHILADELPHIA.

JULY, 3, 1893.

Editor Electrical Worker:

Local Union No. 28 at its last regular meeting had the semi-annual election of officers and the following were elected. President, Jno. A. Freney, 1120 Ridge Ave; Vice-President, Jas. Conway; Financial Secretary, Thos. G. Flynn, 1116 Jackson Street; Recording Secretary, Harry Frazer, 1436 Vine Street; Press Secretary, J. W. Fitzpatrick; Treasurer, John Grant; Inspector, D. McDougal; Foreman, W. H. McFarland. We also elected a fine trio of boys to look out for our sick brothers, and last but not least three delegates to the Trades' Council.

We had a favorable report from the committee that have our excursion in hand. By the way, brothers, let me tell you about the excursion. We are going down that historical old river, the Delaware, August 20, and we are going for a good time, and if we don't have it it won't be any fault of the committee. Such tireless workers as the chairman, Bro. Ed. Powers, and that old stand-by that everybody knows, Billy Friend, and in fact the whole committee, are doing all they can to insure a good time. We extend an invitation to all the Unions to come, but more especially to the brothers of New York, Jersey City, Newark and the other cities close to us. Come over boys and "take one with us."

I notice another letter from that interesting "scribe," Baldy, and must say with him that I take the great amount of deaths, accidents and sickness that has been in our ranks lately as a warning to the boys who are a few months behind time in their dues to move a little faster and catch up with the crowd and get in good standing. No. 28 has indeed been lucky with her members. We haven't lost any through death as yet, but we felt the induction from it; only a few days ago one of our most esteemed brothers, Peter Grant, came near having his circuit opened for good; he, with his men, were resting a 50-foot pole on the old rapid line, south of the city a short ways; they had cut the pole off and dropped it into the new hole, when down came an unused arm, striking Pete on the head; it seems almost a miracle that it did not kill him, but he "come in" all "O. K." and it is my honest opinion that it was his dues that saved him; he is one of the boys that are always in good standing. Moral.

As we will have only four more issues of the journal before the next National Convention, I think it would be a wise plan to discuss a few of the changes that different locals would like to see made in our constitution. Philadelphia has a few things in view that we would like to see changed. While personally I am satisfied with a clause or two in the constitution that the brothers of No. 28 are not, but as I am writing for the Union and not myself I must advocate their views. Let me mention a few of the subjects that might be considered: How much power has the Grand President in case of trouble? Has he the power to call on a Union for money and charge it to the U. B.? Has a member a right to hold office when he is not working at electrical work, one who has formerly been an electrical worker, but who has branched out into another business? I see this question spoken of by other correspondents. The matter of the journal, should the journal be published once or twice a month, and many other subjects that would enlighten the Unions throughout the country, what other Unions need, and so they could instruct their delegates what to work on. Let us hear from you "Baldy."

We lost a valuable member some time ago in

Jno. W. W. Wylie; he took out a traveling card and started for Chicago. We know that what is our loss is Chicago's gain, and we will be only too glad to hear that he has deposited his card with one of our locals in the Windy City. The Union that gets him should have him give one of his interesting lectures on electric lighting, as he is a dandy.

We have just moved into our new quarters, namely, 218 W. 9th Street, and meet the 1st and 3d Tuesday of each month. The boys are always glad to see a visitor, so brothers passing through Philadelphia drop in and see us.

Now, just a few words on a subject that should interest every liberty loving brother in the United States. The various light companies in the city are busy putting in the new city lights, street lights, and I think the Southern Electric Light Co. is about the most rushed of all. This company has for its president a large contractor who is one of those disreputable creatures, a "Dago driver." A few days ago he ushered a gang of his Dagos around to the station and told the foreman to use them as ground men; you can imagine his feelings when he refused to work them, so an up-shot that is between a messenger boy and a superintendent took them out and worked them. We have not had a meeting since, but I expect action will be taken on the matter at our next. Now I don't want the brothers to think it is a matter of nationality with me, but this class of mankind, a Dago, whose only ambition is to get into every conceivable business and work at a \$1.25 a day, would soon be putting on the spurs, soon be wiring houses, soon be ousting us from every place that could be had. I hope we will oust them this time, however.

The boys of No. 28 all join me in congratulating Bro. Kelly on his success with the journal. No better proof of its standing in Philadelphia could be given than this: the boys are anxious to see the next issue as soon as they have finished with one.

Fraternally Yours,

FITZ.

NEWARK.

JULY 4th, 1893.

Editor Electrical Worker:

Well, we boys are still in it, as you see, and continue to hold our own as the "banner local."

On last Monday night we had our regular election of officers and elected for president the great and only Walter J. Curtis.

Walter is quite popular with the boys, as he always has a song or two to drive away dull care and tranquility, and has the reputation of being quite an artist in the musical line, and at the same time can shake a tune out of anything from a piece of "interior conduit" to a harp—which Brother Beatty calls a rheostat—but as Brother Beatty comes from Boonton, we let it go at that.

Brother Kelly came very near getting himself into a bad predicament on last Monday night. Some of the boys persuaded him to sing a song and he started that favorite song of his—"After the Ball Was Over"—but checked himself very suddenly after the first verse, as he noticed some of the boys reaching for their plyers.

Brother Lewis has got a safety bicycle, and with a pair of hooks and a couple of hand-lines tied on the handle-bars, attracts considerable attention.

Brother Harry Rawding (trimmer) inspects his circuit on his "safety" and finds that it saves him a great deal of walking and time.

Brothers Harry Nugent and John Connor are spending the summer at (Drake's Pond) Irvington.

Allow me to say for this district that everything is all right except the hot weather, which has caused some of the brothers to complain, and the only one that seems to enjoy it is Brother C. W. Smith (the tattooed man), who, with his sailor shirt thrown wide open at the throat, catches the eye of all the sweet girls in town.

Hoping to see a few more locals represented in our July number, I remain as usual,

W. E. ROSSETER,
Press Secretary.

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HARTFORD.

JULY 10, 1893.

Editor Electrical Worker:

Local Union No. 37 is moving along splendidly. We are taking in new members at most every meeting. We have all the linemen in the city and surrounding towns where they are stationed in our brotherhood, with the exception of six telephone men, who have tried to return after leaving us, being sugared by the company. We do not want such men after showing the white feather, but true loyal brothers. They already see their mistake, each one looking friendless. Their construction men are composed of longshoremen and truck drivers, and will remain so until the company recognizes us as their equal. Brother Chafee is making preparations for his new electric street railroad, which will bring more men into our brotherhood, as Brother Chafee is a red-hot union man, and you know the rest about who will work for him. Kindly excuse us for not sending in before. Will try and do better the next time. Truly yours,

C. D. E.

P. S.—Would like to hear from Brother Candee.

ALBANY.

JULY 1st, 1893.

Editor Electrical Worker:

Local No. 38 held a meeting last Thursday night and the following officers were elected and installed: President, M. J. Cellery; vice-president, J. R. Carlton; recording secretary, J. M. Wiltse; financial secretary, O. W. Dooney, of Troy; trustee, Wm. Foley; foreman, Geo. Phillips; inspector, D. A. Lapsette, and press secretary, W. G. Poston.

We had a fair attendance, all officers being present with the exception of our inspector, who was absent for the past three meetings. I suppose that either he, his wife or some of their children are sick, so we will let him go this time providing he attends more regularly hereafter. A number of our members are in the country at present, and are unable to attend every meeting, nevertheless we make a pretty fair showing.

Local 38 is not doing as well in some respects as it should. There seems to be considerable dissatisfaction among the members. In the first place they do not study their constitution and by-laws, and consequently when a question is brought before the meeting everybody argues according to their opinions, whether in accordance with the constitution or not; those that take a deep interest in the Union are puzzled. To make my meaning plain I will ask you a few questions. Why is it that when a member is "blacklisted" that his name and description is not published in our journal? And why are we not notified when there is trouble at any place? And, also, how and when it is settled? The first we ever hear of any trouble is when we are asked to contribute, and we never, except in one instance, heard if the parties received the money or not, and never in any case have we been notified officially in regard to any settlement of difficulties of any of the locals.

Now, as to the New Jersey trouble, we know nothing definite in regard to it. We see in the *World* they had settled by arbitration, and later the *Sun* said the trouble was not yet settled; so you see we can not depend much on what the papers say, and we would be much obliged to you if you will give us some light on the subject.

Now, another thing, a number of members have left here without their "traveling cards." Why is it they can go and get work in cities where the Union is supposed to be strong? I would like to see all of the locals take steps to prohibit such things and allow no one to work or enter their lodge rooms unless their "transmitter" is in first-class order.

We have been very fortunate in the past six months, having had no serious or fatal accidents, except in the case of one of our groundmen, who claims to have been bitten by a hornet.

Hoping this will reach you in time for publication, I am,

Fraternally,
W. G. POSTON.

CHICAGO.

JULY 10TH, 1893.

Editor Electrical Worker:

Electrical work in this city is now almost at a stand still. The strike on the Chicago Edison Co. has been declared off.

The fair wheel at the World's Fair is now being used.

The current at the fair grounds is all generated in Machinery Hall except that for supplying the intramural railway. From Machinery Hall the current is carried to all parts of the grounds to be used for whatever purpose necessary.

The exhibits in the Electricity Building are run as motor by current from Machinery Hall.

The wires throughout the grounds are run in subways. These subways are simply passageways with the wires on insulators on side of same and admitting the passage of an inspector at all times. In this they differ from the ordinary subways now in use.

The generating of all the power at one central point and within a few square feet of area is of great significance as showing the direction in which electricity is leading the economics of the world.

The most prominent feature of Machinery Hall plant is the Westinghouse exhibit of generators. It is the largest incandescent plant in existence, and each of its twelve dynamos are larger than ever before manufactured for such work, each having a capacity of 10,000 16-candle power lamps and consumes something less than 1000-horse power when carrying full head. Besides these, 10,000 lighters are on two 4000-light machines. The pressure is 2000 volts transformed to 100 volts at the lamps. Another feature of this wonderful plant is the 2000-horse power Allis-Corliss engine, which is coupled to two of the large generators. However, this engine has a twin in the intramural railway plant. The switch-board is another attractive feature and is reached from a gallery. The "dynamo board" is 12 feet high and 40 feet in length, and the feed-board 9½x71 feet. Nearly 15,000-horse power of machinery is controlled by this switch-board.

The intramural railway was the first road in America to operate high-speed trains electrically. The Gen. Electric Co. organized the Western Dummy Co. and secured the concession for operating this elevated road inside the grounds. The trains consist of one motor car pulling three trailers. The motor car has a motor geared to each of its four axles. These motors together can exert about 500-horse power, or equal to a light steam engine. The current is supplied to the motor by a third rail laid alongside the track, and the return circuit is completed through the other two rails the same as in the ordinary electric road. The contact with this third rail, which corresponds to the trolley wire of the ordinary electric road, is made by means of a shoe instead of a rolling trolley. The controlling switches are so massive that it was necessary to manipulate the same by compressed air. At the power house of this road is the largest dynamo in the world. It is a 1500 Keto Mott machine of over 2000-horse power. The armature was too heavy for shipment, therefore necessitating the winding of the same in the power house. It is directly on the shaft of the engine driving it, forming a massive piece of machinery. The weight of the armature shaft and fly wheel is 180 tons. The fly wheel on the same shaft is 25 feet in diameter, and a section of its rim has a dimension of 20 by 24 inches.

There are 1200 2000-candle power arc lamps in the Manufactures and Liberal Arts Building and the Gallery of Fine Arts 1600 incandescent lamps.

P. L. R.,

Press Secretary, Local 41.

UTICA.

JULY 9TH, 1893.

Editor Electrical Worker:

The Utica Local starts out on the new official term with renewed hopes of success, and as a plan has been proposed for making our meeting place

a resort for members every evening where they will be able to find the periodicals most suited to practical men and where the boys will be encouraged to give speech to their ideas, and to teach and be taught. There are many helpful schemes and suggestions lying dormant in some of those heads which would be all the better for being discussed I am sure and I think they will need only a little encouragement to bring them to light. There are members who object to this plan, of course, but then I suppose there were people who objected to the founding of the brotherhood, but a few kickers, more or less, should not stop others in their march of progress, and I hope by the time for the next letter comes around to be able to report some intelligent action in the matter, all that kickers may say to the contrary.

Well, as last meeting was election of officers I must report accordingly and leave you to form your own opinion as to the good judgment of Number 42. One thing is sure, they might have made a much better selection for the chair, but they for some wise and noble purpose, no doubt, overlooked the better material in their selection. The election resulted as follows:

President, Harry Gordon; vice-president, Will Brigham; recording secretary, Ed. S. Allen; financial secretary, Chas. Richardson; treasurer, H. S. Bowen; foreman, J. Chisholen; inspector, M. M. Morris; trustee, Thos. Costello; press secretary, H. Gordon.

Of course there will not be many outside our new local who know our new officers but by name, but that is their loss, and should they ever wish to become better acquainted they have only to call on us and we will use them well, so that they shall take none but pleasant memories away with them; so remember boys, don't pass us without calling.

The neighboring town of Whitestown is to be wired for 21 2000-candle power arc lights. The installation and operation of the plant is in the hands of the Utica Electric Light Company. This company is also placing the ground return of power circuits with a metallic line, which will save a good deal of trouble with lightning.

Well, I must draw to a close. Hoping that all locals will be satisfied with the result of their elections, I remain,

Fraternally Yours,

HARRY GORDON,

Press Secretary.

ROCHESTER.

JULY 7, 1893.

Editor Electrical Worker:

Another month has passed and gone like all the months gone before it, carrying with it its month of happiness, joy, sorrow and pain; its accidents to our craftsmen, who a short month ago were in the full vigor of manhood, are now cold in death, killed by that unseen harbinger of death, the electric current. Each death of this kind should warn us of the danger—warn us to be careful and always keep our heads; keep cool, be ever on the alert, and much of the danger will be avoided.

Allow me to say that Union 44 is doing nicely. We are taking in new members every meeting.

I read with pleasure the marriage of our Grand Secretary and Treasurer, Bro. J. T. Kelly. No. 44 extends its congratulations, and we hope his wedded life will be one of perpetual sunshine and joy, and may his life be as happy and free from care as the beasts of the forest and birds of the air, and all his cares be little ones.

The value of the ELECTRICAL WORKER can not be overrated; it is just the paper for our craft; it keeps them posted on all matters of interest.

Now, a few words to the boys in general in our brotherhood: Keep up the good work, don't be discouraged. Remember the success of your Unions depends on your own individual efforts. Always keep in mind it takes but seven members for a meeting and if you attend regular it takes just six more. Don't leave it to some one else to run, but put your shoulder to the wheel and things will go all

Jul 1893

right. Don't give up your interest in the brotherhood because things don't go your way every time. You must remember that there are as many men who can't agree as there is fish that swim the sea. Remember we all have opinions of our own. Let none feed on the dry dust of other men's opinions, but have minds of our own and express them. If some one of the brothers don't think just as you do why, let it go at that, and remember majority rules every time, and if any one of us should quit, the brotherhood would go on just the same. And don't get chicken-hearted and want to throw up the sponge because the Electrical Brotherhood has its setbacks and don't gain every point; it takes time for all things. Oh, what a grand thing this brotherhood would be if all the electrical workers throughout this country would join, but unfortunately, like all other movements, there is always a certain few that hold back. But never mind, boys, some day these men will come into the fold; for While the lamp holds out to burn The vilest sinner may return.

Let us keep right on the even tenor of our way and there can be but one ending to crown our efforts, and that will be success, and some day in the future instead of fifty unions there will be unions from the slumbering woods of Missouri to the golden shores of California.

I hope the St. Louis boys had a good time at their picnic. We will give one in the near future, and then there will be lots of fun talking over old times and stringing over again the wires we put up years ago.

Now I will close for fear the editor will condemn me to the waste basket.

I am, fraternally,
HARRY W. SHERMAN,
Press Secretary.

BUFFALO.

JULY 1, 1893.

Editor Electrical Worker:

Last Monday was our regular meeting night and we had quite an exciting time balloting for officers. Brother Colvin was elected president, and a better man could not be found in seven States to fill the office with better satisfaction to the brothers. He keeps the boys in good shape and what he says generally goes. We are getting along splendidly. We have from one to three members every meeting, and at the rate we are going now we will soon have our circuit in good shape. The Trolley Company is doing a large amount of work here and will soon have a network of wires overheard, and horse cars will soon be out of sight. The Bell Telephone Company intends to extend their underground circuits during the present season.

Fraternally,
W. L. PIERCE,
Press Secretary.

SEDALIA.

JULY 7th, 1893.

Editor Electrical Worker:

This being my first attempt you may find this contribution somewhat faulty. Having been elected Press Secretary it is with pleasure that I can announce that No. 48 is on earth and with both feet, too. We have a membership of seventeen and prospects for more. We are now at home in our new hall, one of the finest in the city, which we were enabled to procure at a low price through the intercession of Bro. Joe Schernbee, who is a member of the order from which we lease the hall. We will be pleased to have visiting brothers meet with us on the second and fourth Thursdays of each month. We intend to procure a blackboard before our next meeting, and hereafter we hope to get some benefit out of the 18th order of business. So far we have had no discussions on electrical subjects. The brothers are all too shy to talk, but I think they will get tame pretty soon.

Bro. Ed McCoy met with an accident on the 3rd inst. which may lay him up for a week or so. While working in the Electric Street Railway's shop here

he dropped a heavy casting on his left foot, mashing it pretty badly.

The Street Railway Company is building some new track, but will need no more linemen than they have now. All the brothers seem well pleased with the workings of the N. B. E. W. Of course they can not see the full benefit of such a thing where there is no more work than there is in Sedalia.

Everybody is waiting for the ELECTRICAL WORKER; they say it is a "good thing."

As I may take up too much room I will open the circuit until some other time.

C. E. JACKSON,
Press Sec'y No. 48.

BLOOMINGTON.

JULY 10.

Editor Electrical Worker:

Hope you can find room in your paper for No. 49. We are young and small yet, having just started in the good work, but we will do all we can for the brotherhood. We meet first and last Sunday afternoons of each month, as several of the boys work nights. We have three new applications in and will probably have more ere next meeting. Our friend and brother, Wm. McFadden, of the St. Louis Connecting Company, had a bad gash cut over his eye last week from a connecting brake. C. F. Snyder got his hand burnt fixing a connection, but both are still working.

All our boys were out Sunday last to our first meeting and seemed to take great interest in the work, especially when Brother Garlbert made telephonic connections with the brewery. If any brother comes out this way we will treat him "O. K." Ask Brother Grand Secretary-Treasurer Kelly if we can entertain well. We had the pleasure of making the acquaintance of our grand secretary-treasurer when he came here to install us, and now wish to express our thanks for the able manner in which he did his work.

Making our initial bow to the rest of the locals and brothers, we are, fraternally,

A. J. ARNOLDS.

RECORD OF PATENTS.

The following recent electrical patents are reported by Higdon & Higdon & Longan, patent lawyers, 215, 216 and 217 Odd Fellows' Building, St. Louis, and 48 Pacific Building, Washington, D. C.:

- 500,027—Electric Bell—William J. Murdock, Boston, Mass.
- 499,871—Trussed Trolley Board for electric cars—Henry Cochran, Chester, Pa.
- 499,737—Secondary Electric Clock—Richard S. Howland, Providence, R. I.
- 499,930—Electric Cut-out—Otto F. Persson, Lynn, assignor of one-half to H. S. Schelin, Boston, Mass.
- 500,026—Electric Lighting System—Charles. L. Morey, Centralia, Ill.
- 499,769—Electric Motor Regulator—George R. Whittingham, Baltimore, Md.
- 500,041—Electric Signal—George W. Swartz, Florence, Ala.
- 499,780—Means for Storing and Supplying Electrical Energy by Natural Force—Frederick G. Corning, New York, N. Y.
- 500,053—Incandescent Electric Lamp—Edward E. Carey, Boston, Mass.
- 500,075—Incandescent Electric Lamp—William E. Nickerson, Cambridge, Mass.
- 499,916—Mode of and Means for Renewing the Filaments of Electric Incandescent Lamps—Gustav A. Frei, Springfield, Mass.
- 500,066—Electric Locomotive—John C. Henry, New York, N. Y.
- 500,065—Electric Conduit for Electric Railways—John C. Henry, New York, N. Y.
- 500,067—Electric Locomotive—John C. Henry, New York, N. Y.
- 500,068—Electric Railway System—John C. Henry, New York, N. Y.

500,069—Power Transmitting Mechanism—John C. Henry, Westfield, N. J.

500,070—Electric Railway Trolley—John C. Henry, Westfield, N. J.

500,456—Automatic Circuit Breaker—Alexander Wurts, assignor to Westinghouse Electric and Manufacturing Company, Pittsburgh, Pa.

500,455—Automatic Short Circuit for Constant Current Machines—Alexander Wurts, assignor to Westinghouse Electric and Manufacturing Company, Pittsburgh, Pa.

500,454—Lightning Arrester—William Wurdack, assignor to Inter-State Complete Electric Construction Company, St. Louis, Mo.

500,465—Current Motor—J. T. Bibb, Tacoma, Wash.

500,229—Electric Cut-out—Ernst Egger, assignor of one-third to A. Naumburg, New York, N. Y.

500,201—Cut-out for Electric Light Systems—James S. George, Jr., Philadelphia, Pa.

500,199—Push Button—James S. George, Jr., Philadelphia, Pa.

500,200—Push Button Cut-out—James S. George, Jr., Philadelphia, Pa.

500,248—Fusible Cut-out—Stephen A. Young and C. Alden, Maryville, Mo.

500,301—Electric Generator and Motor—William Stanley, Pittsfield.

Electrical Heater—Earl P. Wetmore, Helena, Mont., assignor of one-half to S. Z. Mitchell, Portland, Ore.

500,404—Electric Indicator—William B. Luce, Brookline, Mass.

500,357—Electric Lighter—Bernhard Tropp, assignor of one-half to G. C. Wright, New York, N. Y.

500,192—Electric Lighting Device—William H. Clewley, Providence, R. I.

500,403—Dynamo Electric Machine—Frederick H. Loveridge, assignor to Standard Electric Company, Chicago, Ill.

500,400—Dynamo Electric Machine or Motor—Philip Lange, assignor to Westinghouse Electric and Manufacturing Company, Pittsburgh, Pa.

500,132—Electric Motor and Dynamo Electric Machine—Rudolph M. Hunter, Philadelphia, Pa., assignor to Thomson-Houston Electric Company of Philadelphia, Pa.

500,288—Electrical Heater—James F. McElroy, Albany, N. Y., assignor to Consolidated Car-heating Company, Wheeling, W. Va.

500,506—Inclosed Conductor for Electric Railways—John A. K. McGregor, assignor of one-fourth to H. R. Powers, Chicago, Ill.

500,274—Regulating Switch for Electric Elevators—Mortimer M. Moore, assignor of one-half to J. F. Walther, Erie, Pa.

Galvanic Battery—Mortimer M. Hayden, New York, assignor to Law Battery Company of New Jersey.

500,488—Insulating Device for Preventing Electric Currents in Pipes—Simon D. Gratia, assignor to Fay Gas Fixture Company, St. Louis, Mo.

500,341—Electric Arc Lamp—Wilhelm Mathiesen, Liepsic, Germany.

500,422—Electric Arc Lamp—Charles A. Pfluger, Chicago, Ill.

500,421—Hanging Device for Electric Arc Lamps—Charles A. Pfluger, Chicago, Ill.

500,423—Double Pole Switch—Charles A. Pfluger, Chicago, Ill.

500,279—Incandescent Electric Lamp Filament—John Criggal, Newark, N. J.

An enterprising person in an Eastern city, of the shop-keeping persuasion, proclaims that he will pay \$10,000 to any person who will discover or invent, patent and transfer to him a practical device for propelling bicycles by electricity. He intimates that the storage battery is probably not the thing. We drop this word of caution to aspiring inventors: When you have invented a successful device of this kind do not permit yourself to be tempted for one moment by the glittering bagatelle of a ten thousand-dollar prize. Remember that 200,000 bicycles are sold every year. However, we think the shop-keeper runs small risk in making the offer, and might just as well make the amount \$100,000 while he is about it.

Jul 1893

ALFRED A. EICKS.

HERBERT S. ROBINSON.

Eicks & Robinson, PATENT EXPERTS,

And Solicitors of American and
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INTRICATE ELECTRICAL AND STEAM
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« REFERENCES. »

- A. S. ALOE & COMPANY, ST. LOUIS.
- U. S. ENGRAVING COMPANY, ST. LOUIS.
- SLIGO IRON STORE COMPANY, ST. LOUIS.
- "ELECTRICAL WORKER," ST. LOUIS.
- I. HAAS & COMPANY, PUBLISHERS, ST. LOUIS.
- CREAT WESTERN FEED COMPANY, ST. LOUIS.
- BOLLMAN BROS. MUSIC COMPANY, ST. LOUIS.
- ROBT. D. PATTERSON STATIONERY COMPANY, ST. LOUIS.
- ST. LOUIS DRESSED BEEF AND PROVISION CO., ST. LOUIS.
- COVENANT MUTUAL LIFE INSURANCE COMPANY, ST. LOUIS.

DIRECTORY OF LOCAL UNIONS.



(Secretaries will please furnish the necessary information to make this directory complete. Note that the time and place of meeting, the name of the President, the names and address of the Recording and Financial Secretary are required.)

No. 1, St. Louis, Mo.—Meets every Tuesday evening at 305½ Olive st. John Hissrich, Pres.; M. L. Purkey, R. S., 706 Pine st.; W. G. Frey, F. S., 1110 N. High st.

No. 2, Milwaukee, Wis.—Meets 1st and 3d Wednesday at 526 Chestnut st. F. G. Raymond, Pres.; M. J. Quirk, R. S., 87 27th st.; J. A. Paige, F. S., Telephone Exchange.

No. 3, New York, N. Y.—Meets every Thursday evening at Clarendon Hall, 114 E. Thirteenth st. Second and fourth Thursdays are devoted to lectures and instructions on practical electrical subjects. Wm. Ivary, Pres.; Geo. H. Middleton, R. S., 115 Clinton Place; Clarence Ingham, F. S., 211 E. Ninety-sixth st.

No. 4, New Orleans, La.—Meets 1st and 3d Wednesday at Odd Fellows' Hall. Wm. Moake, Pres.; J. C. Bradley, R. S., Custom House and Napoleon sts.; J. J. Vives, F. S., 211 S. Rampart st.

No. 5, Nashville, Tenn.—A. H. Prauge, Pres.; Ed Farewell, R. S., 1306 N. Market st.; E. W. Morrison, F. S., 308 N. Summer st.

No. 6, Memphis, Tenn.—E. J. Gray, Secretary, 20 Gooch st.

No. 7, Springfield, Mass.—Meets 1st and 3d Monday at Winkler's Hall, Bridge st. John F. Hoyt, Pres.; F. Wyatt, R. S., Hotel Glenham; S. F. Cameron, F. S., 281 Main st.

No. 8, Toledo, O.—Meets Every Thursday at 223 Summit st. James Carney, Pres.; Michael Connors, R. S., 213 Everett st.; T. H. Nevitt, F. S., 1007 Bartlett st.

No. 9, Chicago, Ill.—Meets every Saturday at 199 E. Randolph st. G. W. Edison, Pres.; Gus Sauers, R. S.; J. H. Capps, F. S., 199 E. Randolph st.

No. 10, Indianapolis, Ind.—Meets every other Monday at 33½ S. Illinois st. J. L. McCreary, Pres.; Lee Hart, R. S., 177 Buchanan st.; C. W. Neal, F. S., 230 N. Maryland st.

No. 12, Evansville, Ind.—Meets every Tuesday at Tenney Hall, Main st. R. Wright, Pres.; Harry Fisher, R. S., 200 Clark st.; L. Riggs, F. S., 416 Upper Fourth st.

No. 13, Cincinnati, O.—Meets every Wednesday at Eureka Hall, Ninth and Walnut sts. H. D. W. Glenn, Pres.; M. F. Thomas, R. S., 86 W. Ninth st.; J. P. Corrigan, F. S., 165 E. Third st.

No. 14, Bridgeport, Conn.—C. F. Callahan, Pres.; Ed Fagan, Jr., R. S., 78 Gregory st.; W. O. Kellogg, F. S., 160 Cannon ave.

No. 15, Worcester, Mass.—Chas. Cumming, R. S., 393 Main st.

No. 16, Cleveland, O.—Meets every Saturday at 94 Superior st. J. J. McGovern, Pres.; N. Duff, R. S., 44 Wilson Place; J. I. Jennings, F. S., 265 Waverly ave.

No. 17, Detroit, Mich.—Meets 1st and 3d Thursday at Trades' Council Hall, 224 Randolph st. T. Shuttleworth, Pres.; W. C. Stuart, R. S., 71 Henry st.; S. R. King, F. S., 636 Hastings st.

No. 18, Kansas City, Mo.—Meets every Friday evening at Industrial Hall, cor. Eleventh and Main sts. C. H. Adams, Pres.; A. G. Knowlton, R. S., 709 McGee st.; J. H. Lynn, F. S., 620 Tullis Court.

No. 19, Pittsburgh, Pa.—W. W. Glenn, Pres.; C. C. Logan, R. S., 210 Emerson st., East End; C. Murphy, F. S., 107 Second ave.

No. 20, New Haven, Conn.—Meets first and last Saturday at Trades Council Hall. S. R. Morrison, Pres.; D. C. Wilson, 157 St. John St., R. S.; J. Carter, F. S., 270 Hamilton St.

No. 21, Wheeling, W. Va.—Meets first and third Tuesday at Trades Assembly Hall. C. L. Ullery, Pres.; J. F. Bonnett, R. S., 2623 Jacob st.; William C. Prickett, F. S., box 111.

No. 22, Omaha, Neb.—Meets every Tuesday at 112 S. 14th st. J. J. Dooley, Pres., 1405 Jackson st.; Fred M. Van Dervoort, F. S., 1110 South 82d st.

No. 23, St. Paul, Minn.—Meets second and fourth Tuesday at Labor Hall, 70 E. 7th st. G. W. Ellis, Pres.; W. J. Bell, R. S.; F. A. Zimmerman, F. S., 66 Douglass st.

No. 24, Minneapolis, Minn.—Meets second and last Friday. P. J. Flemming, Pres.; W. Allen, 822 Eighth av., S., R. S.; Geo. Hulig, F. S., 25 Seventh st., south.

No. 25, Duluth, Minn.—Phil. Bellevue, F. S., 18 West Superior st.

No. 26, Washington, D. C.—Meets every Friday evening at K. of P. Hall, 425 Twelfth st. Albert Mann, Pres.; J. F. Sheridan, R. S., 1201 11th st., N. W.; L. Leach, F. S., 1608 Crescent st., N. W.

No. 27, Baltimore, Md.—Meets every Monday at hall cor. Fayette and Park aves. Fred Russell, Pres.; G. W. Spellman, R. S., 604 Wyeth st.; S. R. Wilcox, F. S., 1519 East Monument st.

No. 28, Philadelphia, Pa.—Meets first and third Tuesday at 218 W. 9th st. John A. Freney, Pres.; H. B. Fraser, R. S., 1425 Vine st.; Thos. G. Flynn, F. S., 1116 Jackson st.

No. 29, Atlanta, Ga.—H. W. Bogle, Pres.; J. W. Stanford, R. S., 22 Ridgon st.; H. E. Bullis, F. S., Georgia Electric Street Co.

No. 30, Trenton, N. J.—S. L. Runkle, Pres., Trenton Electric Light and Power Co.; Ed. Anderson, R. S., Trenton Electric Light and Power Co.; Joe Harris, F. S., 211 Lambert st.

No. 31, Jersey City, N. J.—Anderson, Pres.; O. Demert, R. S., 149 Newark ave.; John Spiecher, F. S., 105 Newark ave.

No. 32, Paterson, N. J.—Meets first and third Monday at German Union Hall. F. J. Clancy, Pres.; Jas. Maher, R. S., 348 Grand st.; Roy Clark, F. S., 409 Paulson ave.

No. 33, Newark, N. J.—Meets every Monday evening at No. 58 Williams st. Walter J. Curtis, Pres.; J. S. Stiff, F. S., 38 Elm st.; W. Whitehouse, R. S., 117 Quitman st.

No. 34, Brooklyn, N. Y.—T. J. Holihan, Pres.; T. L. White, R. S., 314 State st.; P. J. Dunn, F. S., 219 Adams st.

No. 35, Boston, Mass.—Meets first, second and third Wednesday and last Sunday, p. m., of each month at Wells Memorial Hall, 987 Washington st. Ira M. Mosher, Pres.; D. O'Brien, R. S., 1 Pine st.; P. H. Dacey, F. S., 38 Albion st.

No. 36, New York, N. Y.—Meets first and third Thursday at Ledwith Hall, Forty-fifth st. and Third ave.; J. E. McGinty, Pres.; Alex T. McCabe, R. S., 13 Morton st.; F. P. Ruane, F. S., 76 Lexington ave., N.

No. 37, Hartford, Conn.—Meets first and last Friday of each month at Central Union Labor Hall, 11 Central Row. Morris Cavanaugh, Pres.; J. T. Neville, 391 Allen st., R. S.; C. E. Byrne, F. S., 16 John st.

No. 38, Albany, N. Y.—Meets the 1st and 3rd Thursday of each month. M. J. Celler, Pres.; John M. Wiltse, R. S., 260½ Livingston ave.; Owen Dooney, F. S., 4 Rensselaer st., Troy.

No. 40, St. Joseph, Mo.—Meets every Saturday at Weidmeier & Wildburger's Hall, 623 Messanie st.; M. L. Durkin, Pres.; Wm. Dorsel, 1708 Calhoun st., R. S.; R. W. Stockwell, F. S., M. & K. Tel. Co.

No. 41, Chicago, Ill.—Meets every Wednesday at 116 5th ave. Chas. B. Quealy, Pres.; W. D. Boehm, R. S., 437 47th st.; Louis Coche, F. S.

No. 42, Utica, N. Y.—Meets 2d and 4th Thursday at Trades' Assembly Hall, Blecker st. Harry Gordon, Pres.; E. S. Allen, R. S., 25 Cornelia st.; Chas. Richardson, F. S., 27 Spring st.

No. 43, Syracuse, N. Y.—B. F. Martin, Pres.; A. D. Donovan, R. S., 305 Temple st.; Chas. Beattie, F. S., 217 N. Crouse ave.

No. 44, Rochester, N. Y.—W. Carroll, Pres.; H. W. Sherman, 9th and Rowe, R. S.; J. Desmond, Western and North ave., F. S.

No. 45, Buffalo, N. Y.—Meets every Monday at Harmonica Hall, 262 Genesee st. E. Calvin, Pres.; Frank Hopkins, R. S., 77 Swan st.; H. L. Mack, F. S., 88 Eber st.

No. 46, Reading, Pa.—Lucian Bowman, Pres.; Harry Weidner, R. S., 225 Pearl st.; Jacob F. Winebrake, F. S., 312 N. 9th st.

No. 48, Sedalia, Mo.—Meets every Thursday at Second and Ohio sts. C. E. Jackson, Pres. C. C. Ballard, R. S., 228 Vermont ave.; Ed. McCoy, F. S., 610 E. 3rd st.

No. 49, Bloomington, Ill.—Meets at Trades' Assembly Hall, 1st and last Sunday of each month. J. T. Lemons, Pres.; A. J. Arnold, R. S., 806 W. Jefferson st.; C. F. Snyder, F. S., 313 W. Front st.

No. 50, Birmingham, Ala.—M. V. Moore, Pres.; 620 18th st., South side; T. A. Tompson, F. S., 715 22d st.

No. 51, Scranton, Pa.—John O'Laughlan, Pres.; John B. Reilly, R. S., 525 Pleasant st.; F. J. Neave, F. S., 452 N. Main st.

No. 52, Wilkesbarre, Pa.—W. B. Cole, Pres.; W. F. Barber, R. S., 415 Wyoming ave., W. Pittston, Pa.; B. M. Lewis, F. S., Wilkesbarre Telephone Exchange.

No. 53, Harrisburg, Pa.—Geo. Smith, Pres.; J. M. Reilly, 1280 Cameron st.

No. 54, Peoria, Ill.—O. H. Norton, Pres.; J. Mahoney, R. S., Peoria Electric Plant; W. H. Overall, F. S., 123 S. Jefferson ave.

No. 55, Des Moines, Ia.—J. C. Thraillkill, Pres.; Mark Carter, R. S., Room 13 Turner Bldg.

No. 56, York, Pa.—W. A. Hassler, Pres.; H. R. Glassick, R. S., East Chestnut st.

No. 57, Salt Lake City, Utah.—Thos. McGrail, Pres.; R. H. Gilliland, R. S., Fire department.

No. 58, Lancaster, Pa.—H. Elmer Werline, Pres.; John K. Shoemaker, R. S., 315½ West King st.

GENERAL NEWS.

Where Electrical Workers May Look for Work.

PITTSBURG, PA.—The Schenley Park and Highland Electric Railway Company has increased its capital stock from \$100,000 to \$300,000 for improvements, and cars will soon be running.

AMSTERDAM, N. Y.—General Manager Snell, of the Amsterdam Electric Road, states that surveyors are now at work on the proposed extension to Johnstown and Gloverville, and that the road will be built to those points within a year. He states that the extension can be built and equipped for \$200,000.

WORCESTER, MASS.—The Consolidated Street Railway Co. and the Worcester Electric Light Company have contracted for another 500 horsepower generator to be located at the works of the latter to furnish power for the Main Street and West Side lines. General Manager Akerman, of the Street Railway Company, states that both these lines will be operated by electricity before the New England Fair opens in September.

SAN FRANCISCO, CAL.—The stockholders of the North Beach and Mission Railway will vote in August on the issue of \$2,000,000 worth of bonds. Gustav Sutro, who holds the controlling interest, wishes to rebuild the road and change it into an electric system. Transfers will be issued now at all points where the North Beach and Omnibus systems come in contact. Gustav Sutro, President.

PASADENA, CAL.—The Los Angeles Consolidated Electric Road will soon build a double track road to Pasadena and convert all Pasadena street railways into electric roads. Total distance about 25 miles. General H. H. Sherman, President, Los Angeles.

SAN ANTONIO, TEX.—The Citizens' Street Railway Company will extend its lines to Government Hills in the suburbs.

WESTON, W. VA.—The local electric lighting plant has been burned. Loss, \$10,000; insurance, \$1500. The plant will be rebuilt at once.

CHICAGO, ILL.—The Council has passed an order directing that all telephone and telegraph poles on North Clark Street, between the river and Lincoln Park, be taken down and the wires placed under ground.

MANITOU, COLO.—Franchises have been granted to Hon. M. A. Leddy, to construct an electric railway on Manitou and Ruxton Ave. Work on the road will commence September 1st. The cost of building the line will amount to \$50,000.

TACOMA, WASH.—J. H. Cummings, formerly superintendent of the Tacoma Railway and Power Company, has settled his claim against the road for \$49,000, and it is stated that, backed by Chicago capitalists, he will undertake to put in a competing system of street railways in Tacoma.

READING, PA.—Chas. Greth and Wm. Hendricks, of Reading, will establish an electric plant-works at Lebanon, Pa.

PITTSFIELD, MASS.—At a meeting of the stockholders of the Stanley Electric Manufacturing Company it was voted to increase the capital stock from \$100,000 to \$200,000 to pay for general improvements.

BROOKLYN, N. Y.—The Kings County Electric Railway Company, capital \$500,000, to build a 16-mile road. Jas. F. Casey, of Albany, and P. H. Flynn, of Brooklyn. The Coney Island, Fort Hamilton and Brooklyn Railway, capital \$500,000; same parties incorporators. These are the roads over which there has been much wrangling, and it is likely that the aid of the courts will be invoked against the building of them.

BOULDER, COLO.—The regents of the university have decided to begin the construction of a mechanical and engineering building. In it will be placed the heating apparatus, also engines and dynamos, so that in the future the buildings on the campus will be lighted by the university's plant. Horace M. Hale, president.

CINCINNATI, O.—President John Kilgour and Secretary James A. Collins, of the Cincinnati Street Railway Company, filed a certificate increasing the corporation capital stock from \$6,750,000 to \$10,000,000.

ELIZABETH, N. J.—The entire plant of the Suburban Electric Company has been burned, and Supt. McGifford states that the loss will exceed \$100,000. In addition to the electric lighting machinery most of the machinery which operates the Elizabeth and Plainfield Railway was stored in the building.

NIAGARA FALLS, N. Y.—The Buffalo and Niagara Falls Electric Light and Power Company has secured a contract for municipal lighting and will put in a plant.

MARTINSBURG, W. VA.—The Western Electric Company will put in an electric light plant at this place.

MILWAUKEE, WIS.—It is said that a movement is on foot to organize a new company in which Capt. Pabst, the brewer, is interested, to put in an electric light plant.

WACO, TEX.—It is said that the Waco Electric Light and Street Railway Company, which will increase its capital stock \$50,000, contemplates putting in an arc plant.

UTICA, N. Y.—The City Council contemplates the establishment of a municipal electric light plant.

KIRKWOOD, MO.—The Suburban Electric Light Company has accepted the franchise for lighting the town by electricity, granted by the Town Board a short time ago, and will begin work at once upon the extension of its wires from Webster Groves to this city.

INDIANAPOLIS, IND.—The Board of County Commissioners of Hamilton County granted a perpetual right-of-way to the Chicago & Central Indiana Electric Railway Company over all the highways of the county.

There is an Electrical Light Association in Japan which has issued a volume of its proceedings in the native language. It appears that twenty central stations are now in operation in that country, and the installation of others is rapidly going on. As a precaution against the effects of earthquakes the machinery is invariably placed entirely upon the ground floor of the stations.

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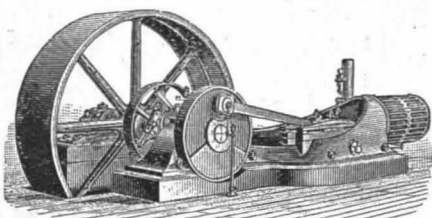
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1	18	"	8	"	"	"
1	18	"	6	"	"	"
1	9 1/2	"	8	"	"	"
1	9 1/2	"	30	Brush	with	"
1	9 1/2	"	25	Ball	"	"
2	18	"	20	U. S.	"	"
1	18	"	30	Jenney	"	"
2	18	"	16	"	"	"
1	9 1/2	"	20	American	no	"
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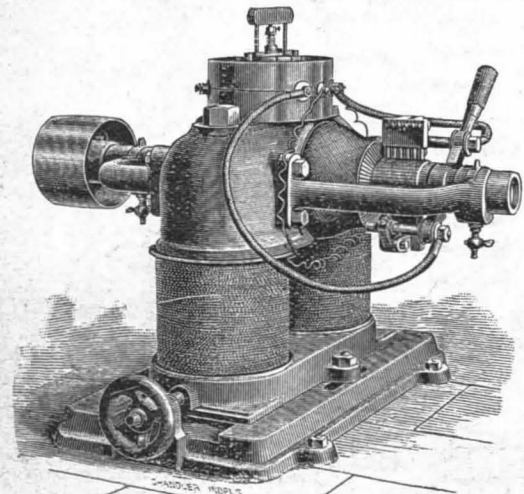
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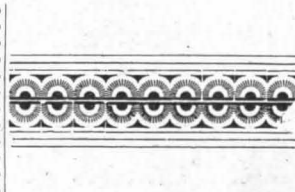
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